ABSTRACT

Title of Thesis: EQUAL LIVING

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Designing with everyone in mind is a phenomenon that is talked about often but is either hit or missed when executed. When it comes to the blind and visually impaired, sensitivity in design needs to be heightened. Factors such as limited access to activities and information, societal stigmas and lack of employment, frequently lead blind and low vision individuals to isolation.

The major sensory organ of a person is their eyes and with only this sense one can identify with and maneuver the information in the environment. The amount of readable material in public spaces that are accessible are often limited to restroom signs, ATM's and phone booths, while signs that may lead you to these same places ironically are not. Through this thesis, the inaccessible built and physical environment will be brought to light, and new tactics and design methods will be established in order to help those with vision impairments regain their independence in society.

EQUAL LIVING:

REIMAGINING THE EVERYDAY BUILDING TYPOLOGY IN ORDER TO ENHANCE THE LIFESTYLES OF ALL, SPECIFICALLY THOSE WHO ARE BLIND AND VISUALLY IMPAIRED

by:

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Dedication

To Donna K. Bryant, my mother, for teaching me from a young age that people are people however they come and that they are capable of all things; they simply need to be afforded the chance to show it.

Acknowledgements

To Madlen Simon, my Thesis Chair, I cannot be more grateful for you believing in me and my vision for not only this project, but for all of the projects I have worked on under your guidance. Without you advice, patience and ability to bring me back to Earth at times has truly brought this design to where it is today.

To my committee members for pushing me and coming up with ample ideas to make this design the best it can be.

To my friends and family for being a huge supp ort system at both my high and low points in this long process. For staying up with me and encouraging me to work when I lost motivation. You all really got me to the finish line, and I am forever grateful.

To my good friend Saundra Black for accompanying me on my personal experiment and ensuring my safety throughout as well as your many ideas and motivational words of encouragement.

To the willing participants of my interviews for giving me incite on your personal life and experiences that heavily drove my research and design ideas.

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Introduction

At the age of 3, I was placed in my mother's infants and toddlers' class, as a language model. She teaches infants and toddlers who are deaf or hard of hearing, blind or visually impaired, and/ or have other developmental disabilities, and taught them as auditory oral students. When I got older, I worked with my mom as a teaching assistant to attain my community service hours for middle and high school.

I remember the first time I worked with a student who was both hard of hearing and blind. He was 3 when I met him, used hearing aids, and was learning to use a walking cane. My mother emphasized the importance of maintaining a normal routine and refraining from treating him differently than the other students, who all had hearing impairments. He would participate in circle time, crafts, skill building, motor, as well as begin to learn braille. Activities were altered to place emphasis on the senses outside of sight, for example when learning shapes, guiding his finger around both the shape piece and the slot that it goes in.

When learning about everyday objects like a toothbrush or shoes, it is important to use actual sizes of things and never miniatures for perception purposes. For example, it is not a clear understanding of a car/school bus to give him a miniature car or bus, but more so to give him part of a seatbelt, or upholstery / cushion material, because the perception a blind person often has with their surroundings, is what they come into physical contact with.

My mother thought highly of all of her students, and truly believed they had all the capabilities possible and often pushed them as much as she could. She also refrained from 'babying' them and sugarcoating the realities of their life, for they will have it a bit harder than most, but that should never hold them back from anything. When asked about this particular

student, after elaborating on some of her memories, she began to laugh and say ". I remember this one time early on when I was teaching him to use his cane. I would say over and over, keep your cane out front, keep your cane out front, so that you can feel what is in front of you, … but he continued to put his cane along the side wall, and so after a little while, I let him walk right into that wall.... he sure put his cane out front after that." (Donna Cain, Infant and Toddler Teacher of the Deaf, Blind and Hard of Hearing) Sometimes learning things 'the hard way' is the way people learn. To me that translates as 'to experience is to learn', which is something that more often than none is how the blind experience the world.

Chapter 1: The People

Exploring the world without sight is a hands-on experience where everyday people are having to literally get a feel for it as it goes. As designers, we typically make design decisions based on what we think people might need and like, based on whatever facts we know about that demographic of people. We can imagine design concepts and envision what it will look like, and therefore be like because we have seen it and experienced it firsthand and know that it works; and if not can implement the idea and see if it works. Most of our world is visual, from our software, to presentations, to the aesthetic of the things that get designed. This then raised the question, “How can I understand how to design for someone blind, when I do not understand what it's like to be blind? The only answer is to try and understand for myself.

I plan to go one day without using my sight, from going to sleep and waking up without it. I wanted to do mostly everyday activities, but also some activities such as go to a restaurant, go to the grocery store, and use public transit. I will be accompanied throughout this journey but will not use a walking cane. I have asked that my accompaniment let me do as much as a can alone, and unless safety becomes a factor to let me make mistakes and get a true experience throughout this process. I would finally like to note that I am not doing this experiment with intent to mock the blind, but to understand, even in the slightest, what it is like to not be able to use my sight.

Personal Experience

Before: I began this experiment the night before the experiment on January 5, to ensure that I woke up to the condition of no vision. I wore a blindfold as well as blacked out glasses to give this effect.

Home:

When I woke up the next morning, I was in an immediate state of shock, for I had forgotten that I was blinded. Once I became oriented to this idea, I began to go about my regular routine. I am very familiar with my home yet found myself still running into objects like laundry baskets and toys my niece had left out. I found placing toothpaste on my toothbrush extremely challenging since I either missed the brush completely or would get the toothbrush to my mouth only to realize the toothpaste had fallen off. This was frustrating at first but by the evening I had got a good handle on it. It was also important to note that I had not organized my items the day before the experiment which made my routine take much longer than normal since I had to search for these items as I went. Size and shape of everyday items are often similar, and I found myself using the wrong items often.

I attempted to make breakfast that morning using the microwave and had a hard time identifying packaging in the fridge. Drinks were often easier to find since the containers were easily distinguishable however understanding boxes in the freezer and which type of an item, I was selecting was a bit more complicated. I ended up opening many boxes to identify the content. The buttons on the newer appliances, especially microwaves are sleek and modern, often

making buttons flush with the others. This made using this appliance by myself extremely difficult and time consuming.

Neighborhood walk:

I walk around my neighborhood very often sighted. I would consider myself familiar with the neighborhood layout and sidewalk system. When navigating this same path blinded, I had very trying experience. I was constantly veering into the grass and lost orientation quickly. It felt like I was walking forever, and I had no idea most times where in the neighborhood I was. I was slightly oriented when the topography changed and I remembered different sidewalk impurities as indication of which house, I was in front of, however overall It was not as enjoyable as is could have been.

Grocery Store:

I went to my local grocery store which I often shop. I began to navigate the space as I remembered it and found that the store had recently rearranged their layout. This is particularly alarming because it pointed out a major flaw in the sensitivity of the user. There are no warnings for these changes to the public and sometimes even the workers which can complicate the experience of someone visually impaired who cannot immediately see these changes. I made a small list for myself of potentially challenging items to pick out at the store This included buying specific types of juice, spaghetti sauce and noodles, red apples, white onions, cereal, and frozen pizza. These items challenged not only location in the store but flavor and price selection. In orientation I often ran into the shelves, could not understand how tall the shelves were, as well as where other people in the store were in relation to me and my cart. From a social aspect, other shoppers and employees were very helpful and respectful of my space needed and were patient

when I was in an area, they may need to get items from. The cashier that checked me out spoke directly to me and not only counted aloud the money I gave but also the amount of change I should receive. She did not use sighted vocabulary like “here” and “this” but told me when she was going to place money in my hand and used direction phrases to orient me to the card pad and my bags. I found this to be a positive representation of blind and sighted interaction.

Restaurant:

I went to a very unfamiliar restaurant to conclude my public experiment before I returned home. I could tell when I was in the lobby of the building since the acoustics were very different to the inside of the restaurant. I had to take an elevator to the proper floor which did not have a voice option however did have braille on the buttons and signage which I was able to read. Upon entering the restaurant, is when my perspective on social interaction changed. The waitress who sat us as well as the waiter that worked our table did not speak directly to me, but only to my friend. I spoke up and placed my order, as well as ordered a drink. When the waiter brought the drinks to the take, he said “here is your strawberry margarita and chips and salsa”. Anticipating he would announce my coconut margarita I waited patiently however it was silent. I asked my friend if he had made my drink yet, and to my surprise she placed my drink in front of me. The waiter failed to directly give me my drink or let me know that it was there at all. This followed true when my food came, for he again placed both plates in front of my friend instead of one for each. When the waiter came to the table for check in’s he never spoke directly to me about how I liked my food, tailoring question specifically to the food on my friends’ plate and not asking general questions like “how is the food” for everyone at the table to answer. I had to impose and answer the questions myself. When it came to the check, I never received a envelope in hand and

had to search the table for my bill. This was a red flag for me since it was clear that either the employees in this restaurant were uncomfortable interacting with me or simply were not trained to do so. This was an overall negative social experience and I hope that this type of treatment will improve in the future.

After:

In reflection of this personal experiment, I am not only overwhelmed with gratitude for the blessing of sight, but I also would like to point out the tremendous bravery it takes people who are blind and visually impaired to try and navigate this built environment that is not completely designed with them in mind. I cannot begin to understand how this demographic navigates on an everyday basis and I have a lot of respect for these individuals, especially children first learning the world. It amazed me how much the sighted can take for granted and how much our non sighted senses do for us, in understanding our surroundings. I have a newly found appreciation for all of my senses and in all of my future designs I plan to keep this exploration in mind.

The Blind

In order to further understand experiences and lifestyle of the demographic being designed for, and to further solidify the research, interviews with people with different types of blindness were conducted. A series of questions about their lifestyles, shown in figure x.x , were used to further understand different experiences where they felt the built environment had failed them and what they felt could be improved. An example response is listed below.

Interview Questions For: Blind & Visually Impaired

Name: Beverly Roman

Age (optional): 57

Age vision was lost: 53

Cause of Vision Loss: Diabetes (bleeding in eye)

Describe your vision capabilities if applicable:
With vitrectomy surgery, blood was removed, frontal vision is significantly diminished, with no peripheral vision.

1. **Describe barriers / obstacles in a typical day.**

    - Impaired vision is restricted in everything. Driving (I only drive during the day on single lane roads) Shopping (font sizes and labels especially price tags are very small) Walking and exercising outside (unevenly paved sidewalks, no distinctive delineation between sidewalks and curbs, street, and lighting)

2. **Do you find it difficult to navigate in the public spaces you currently live near**?

- Navigating the area currently, there are steps to the parking lot from my building that have no railings and that is not helpful.

3. **What is it like to use public transportation if applicable?**

   -The metro' orange line stop in New Carrollton has proven to be challenging. No or poorly lit stairways, is an issue, especially during rush hour (rushing crowds), No clear marking for the end or beginning of steps (the walkways are the same continuous color of the stairs, so I often miss steps not realizing that there are more.)

4. **What public spaces do you find most accommodating and navigable?**

   - Public spaces with well lit parking lots, maintained painted lines and curbs are more navigable.

5. **What public spaces do you find least accommodating and navigable?**

   - The Walter E Washington Convention center in Washington DC has proven to be unnavigable. The very colorful abstract designed carpeting made it difficult to discern where the steps begin and ended (it all ran together) Caused me a couple of spills and falls.

6. **Do you think that the sighted make too many assumptions on your capabilities in public spaces?**

   - Yes, I think that assumptions are often made about the capabilities of the visually impaired. And it is extremely important to consult with people who are visually impaired when designing a building facility to make them accessible.

7. **What do you think the biggest misconception people have about blindness?**

   - Having impaired vision is difficult. People have accused me of seeing if I name something correctly that we are looking at (recognition comes in different ways, sound, smell, or memory.) And its hard for sighted people to fully realize the scope of being visually impaired. Quite literally you need to see to be able to do most things.

8. **If you could give advice on how to educate the public about blindness what would it be?**

    - My best advice on how to educate people about blindness is to listen, to be kind, patient, and helpful. And don't try to convince someone that "they had to see it"

Figure 1.1: Interview Questions for the Blind and Visually Impaired

| *The Sighted* |

For the next part of the interview process, the sighted were interviewed in order to understand how family members, coworkers, friends and the general public feel and understand about blindness. This thesis strives to integrate the blind community with their surrounding communities and therefore understand their personal experiences in daily interactions or in potential situations. An example of responses is shown below in figure X.x.

Interview Questions for the Sighted

Name: Donna Cain

Age:. 60

1. **Describe what it would be like if you were completely blind with your current lifestyle. How would things change?**

    - If I suddenly became completely blind it would totally change my lifestyle. The biggest change would be my independence. I would no longer be able to drive. I am used to jumping in my car and going somewhere any time day or night. Where my home is located, there is no public transportation nearby. I would have to rely on family and friends to take me to work, the store, to appointments and to leisure activities. I think I would want to move to a more convenient location because independence is very important to me. I would still be able to teach but I would have to change to a school for the blind and visually impaired. I would not be able to teach in my current position.

2. **How do you navigate in the dark?**

- I think I navigate mostly from memory. I have lived in the same house for over 30 years. I walk more slowly in the dark and I may put my arm slightly in front of me to avoid bumping into something.

3. **Have you ever interacted with a blind person?**

   - Yes, I have interacted with children who are blind, an adult at my church who is blind and a coworker who is blind.

4. **Have you ever helped a blind person maneuver in a public space?**

   - Yes, I have helped my coworker navigate in public spaces. She will hold my arm/elbow and walk slightly behind me.

5. **What do you think the biggest misconception people have about the blind?**

   - I think the biggest misconception people have about the blind is that they are helpless and unhappy. When you are sighted, you think about all the things you do easily and all the sights you see. It is hard to imagine you would be able to be totally independent and live a full, enjoyable life without sight.

Figure 1.2: Interview Questions for the Blind and Visually Impaired

Chapter 2: Research

Sight is the sense through which the brain receives about 75 % of its information. Sight is possible through the eye, which acts as a channel that visual information can be perceived. All the things that can be seen down to size, shape, and color is collected information that is then interpreted in the brain. This process where the brain interprets information from the eye is what we call vision. Vision is only possible with light, because light rays reflect off objects which are what is received by the eye, then converted into electrical impulses and then interpreted by the brain. Illustrated in Figure x.x is the relationship between light, the eyes, and the brain.

|The Anatomy of the Eye|

To understand the visual process, it is important to understand the eye itself; the organ used to collect and transmit information. The next series of diagrams and information will point out the different parts of the eye and how they function.

The eye is an organ, spherical in shape and around 1 inch in diameter. It is suspended in a cone- shaped structure called the orbit. The orbit is divided by the upper and lower ridge, the eyebrows, and the cheekbone which both serve to protect the eye from direct impact. (Eyelids and eyelashes also serve as means of protection to the front of the eye.) The fatty tissues in the orbit act as a cushion for the eye and help with easy movement.

The eye has three major layers including the sclera, the choroid, and the retina. The sclera, commonly known as “the white of the eye” is the tough outer layer that protects the coat of the eye. The choroid is the middle layer of the eye and consists of many blood vessels. It is the main circulatory layer that supplies the nourishment to different parts of the eye. The retina is

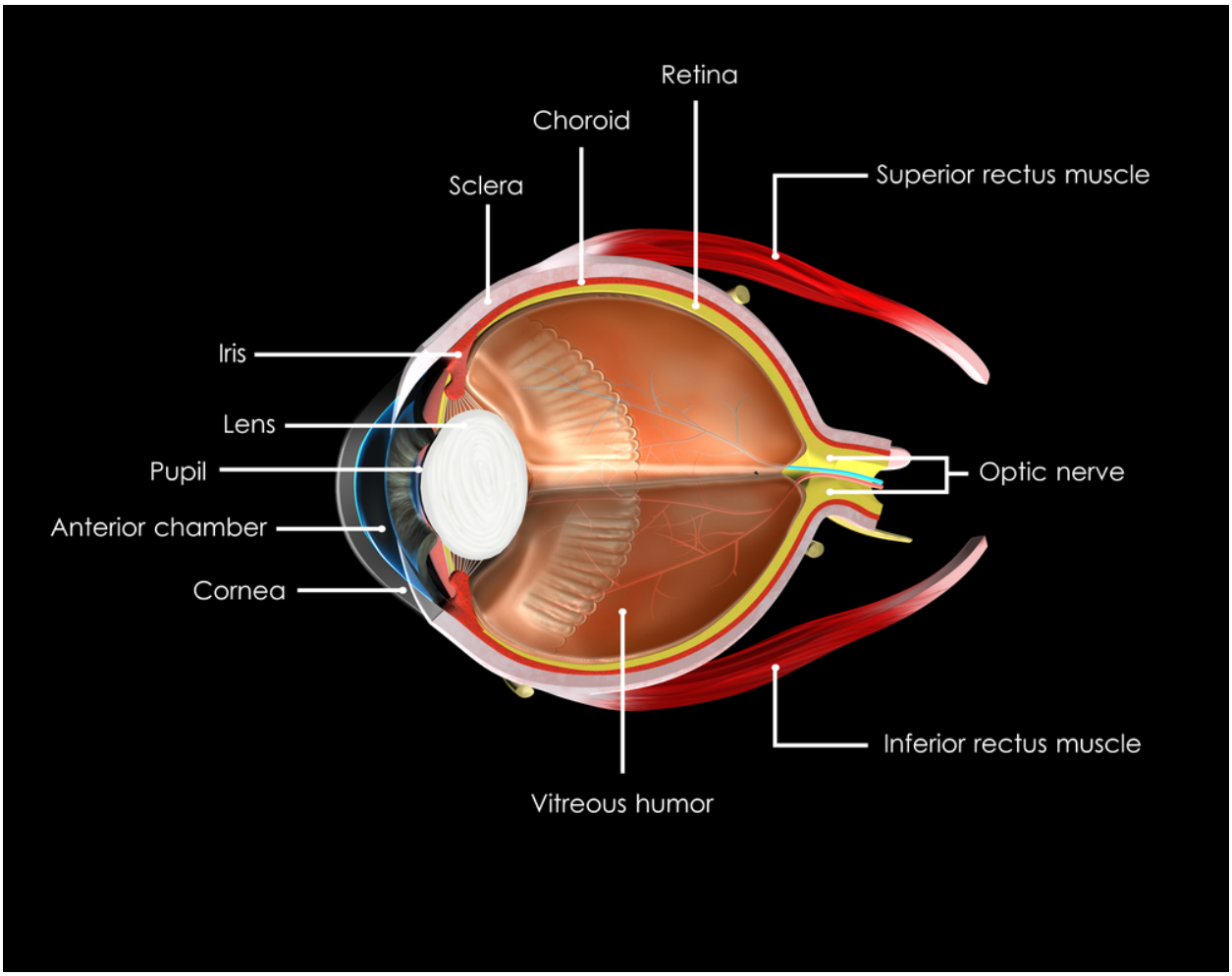


Figure 2.1: Anatomy of the Eye

the inner part of the eye that is a thin sheet of tissue with ten layers of cells. It is used to receive the visual information and send it to the optic pathways of the brain to the optic nerve.

The clear covering on the sclera is a mucous membrane called the conjunctiva. This part of the eye lines the inside of the eyelids and provides nutrients to the front of the eye. The translucent part of the front of the eye is called the cornea. The cornea is the portion of the eye

where the light rays enter the eye. It is composed of 5 layers that refract and bend as light passes. Between the cornea, the iris, and the pupil is a watery space that is called the aqueous humor, which is used to nourish the cornea and the lens.

The Iris is the portion of the eye that gives us our “eye color”. It is a pigment filled ring like membrane that surrounds the pupil which is where light travels through and transmits back to the eye. The lens is a transparent flexible body that is suspended behind the ris. This serves to bend the light rays that enter the eye. The ciliary body is a vascular and muscular structure that shapes the lens and controls the eyes focusing ability. The vitreous humor is a gel like substance that is in the sides and rear of the eye. This substance is in place to maintain the eye's resilience and help pass light onto the retina. The Retina is what receives the reflected light rays and converts them to electrical impulses that are sent to the brain. Inside of the photoreceptive layer of the retina, are many light sensitive receptors that are called cones and rods. The cones provide the colors and fine details of an image while the rods understand form and movement. When all these aspects work together, an optimal level of visual functioning is achieved.

What is Blindness?

In researching a solid definition of what blindness is, it was rare to find a final description that multiple sources coincided with. The dictionary defines blindness as "the state or condition of being unable to see because of injury, disease, or a congenital condition." (Oxford Dictionary) According to the Iowa Department for the Blind, the legal definition of blindness is that" the central visual acuity must be 20/200 or less in the better eye with the best possible correction or that the visual field must be twenty degrees or less." The Federation for the Blind gives a definition that coincides closest with how I was taught to perceive blindness. "We encourage people to consider themselves as blind if their sight is bad enough—even with corrective lenses—that they must use alternative methods to engage in any activity that people with normal vision would do using their eyes." (National Federation for the Blind) To me this translates as a person whose sight allotment requires alternate methods in their lifestyle that allows them to better engage in everyday activities. This thesis hopes to do just that; establish the design flaws in the built environment in order to better design those same everyday typologies for those with visual impairments.

There are many types and causes of blindness, both from birth and later in life. These types of vision losses all vary in what that person may experience and be able to see. Blindness

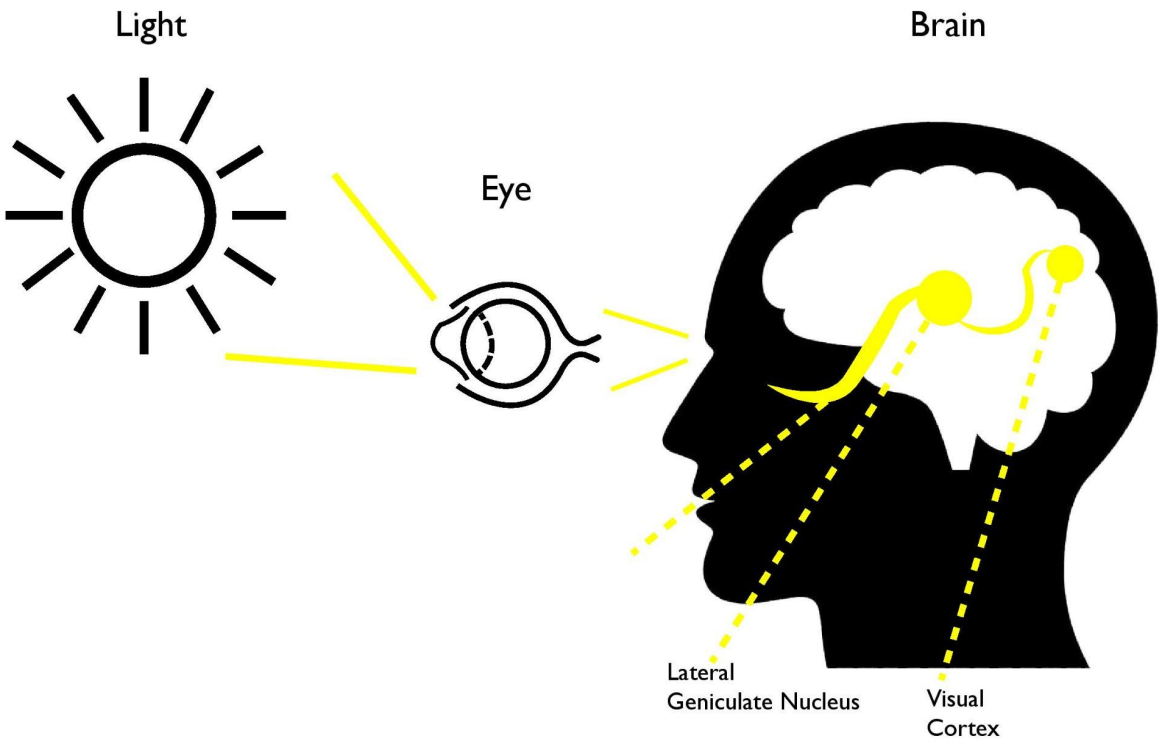


Figure 2.2: Light to Eye Diagram

does not automatically mean that they see total darkness. To understand how the eye functions as an optical system, it is best to understand the optical principles of the eye.

The first principle is refraction. The eye acts as the machine that refracts and or bends light rays. The parts of the eye that are needed to achieve this are the cornea, lens, aqueous and the vitreous humor. The cornea is responsible for about 80% of the eye's refractive power, and the refractive power of the lens changes as it accommodates viewing things at different distances. Accommodation is the process of changing the lens shape and refraction power. This process is controlled by the ciliary muscle, which loosens and causes the lens to either become more convex in further distance viewing or have more bending power for closer distance viewing.

Figure 2.3 shows the accommodative system at rest. When the eye is trying to view an object at 20 ft or more, the light rays coming from the object enter the eye at a parallel and then

come to a point of focus on the retina. A normal eye does not need accommodative powers for the light rays to focus on the retina. When this same eye views an object at a distance less than 20 feet as seen in figure 2.3, the light rays enter the eyes divergent, and the closer the object is to the eye, the more spread out the light rays are. The more divergent the light rays, makes the accommodative system more and more necessary, to bring the light rays to a point on the retina.

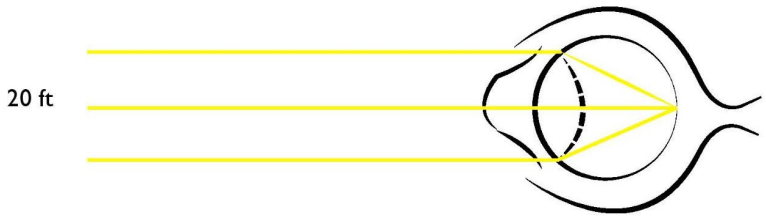


Figure 2.3: Accommodative System

Some common, refractive errors are Myopia, Hyperopia, and Astigmatism. These refractive errors can attempt to be corrected with correcting lenses. Myopia and Hyperopia are both caused by the length of the eye, the amount of refractive power of the eye, or a combination of the two.

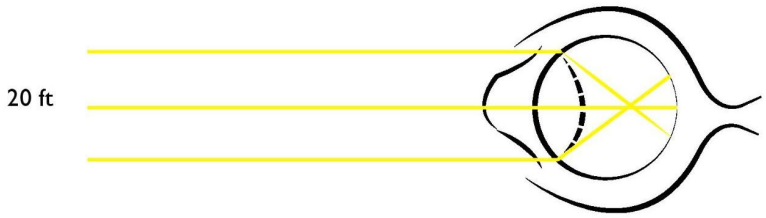


Figure 2.4: Myopia

Figure 2.4 shows an example of an eye that is too long for its focusing ability, which is what causes myopia ,which is more commonly known as nearsightedness. In this condition, the light rays come to a point of focus in front of the retina, which results in a blurry image.

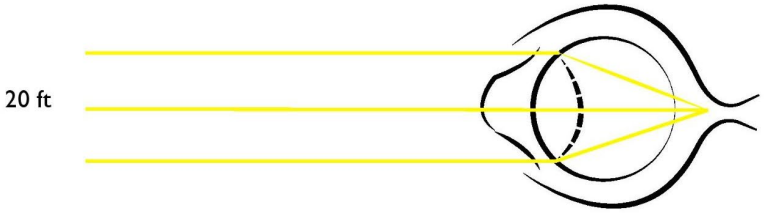


Figure 2.5: Hyperopia

Figure 2.5 shows an example of an eye that is too short for it focusing ability, which is what causes hyperopia, commonly known as farsightedness. In this condition the light rays come to a point of focus behind the retina, which causes a blurry image. Astigmatism is a condition where the light rays are not refracted uniformly in all meridians. This is caused from an irregular cornea or lens curvature and causes blurred and or distorted images. Figure 2.6 shows what the light rays may look like if you have

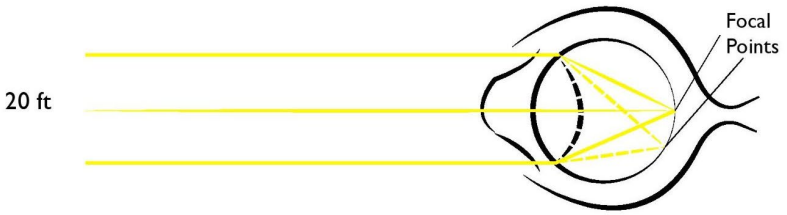


Figure 2.6 Astigmatism

astigmatism.

There are many other causes of visual impairments and blindness that are not corrective with a lens.

Chapter 3: Program

What is the everyday lifestyle? How does the built environment influence the everyday lifestyle? For those whose everyday life is affected because of accessibility, navigation, and usability of spaces, makes living an independent and well-rounded life a bit more complicated. This is often the case for those who are blind or visually impaired. When trying to establish a list of typologies to help alleviate some of the struggles people with vision impairments face, a list of typologies that make up everyday lifestyles must first be established. This was broken down into 3 major categories: live, work, and leisure.

Program Criteria

To properly analyze what needs to be added to the program to enhance the experience for those with visual, analysis on what the current conditions are was conducted. In motive for the live/ work categories, the annual earnings of non-institutionalized persons aged 21- 64 years with a visual disability in the United States in 2016 is $38,500 in 2016 and the number living below the poverty line is about 1,048,600 or 27.7%. The number of non-institutionalized persons aged 21- 64 years with a visual disability in the United States who were employed full-time/full-year in 2016 was 1,120,700 or 29.5% which means that, as for working age adults reporting significant vision loss, over 70% are not employed full-time.

The category of leisure was next to research. Most informational content including signage, labels, books, flyers, and money, lack braille, which makes the readable environment usually limited to ATM's, bathrooms, and phone booths. Navigation to these same stations is not always labeled, however. Each of these points and statistics point out potential problems in the

built environment relating to affordable housing, career building, the workplace, and navigating the urban environment.

The goal in this thesis is to help integrate the blind and the sighted in the built environment. The program therefore should encourage collaboration and removal of cultural barriers through shared experiences between the blind and sighted as well as offer a multi-sensory experience that can become a catalyst for urban environments all over.

After analyzing the needs for those with visual impairments in the build environment, I used these categories to establish a list of criteria that can aid not only their everyday lifestyles but also integrate the communities needs to create a rich community hub. Figures (xxx-xxx) are tables with the different scores for each program

Program Selection

For those whose everyday life is affected because of accessibility, navigation, and usability of spaces, makes living an independent life a bit more complicated. This is often the case for those who are blind or visually impaired. By placing lifestyle specific programs on site with new design principles that will enhance the experience of those with visual impairments, this site proposal will not only bring needed uses to the surrounding community but will also become an important resource to a demographic under considered, in the same community. This capstone represents phase one of the development, and in this first building, all goals of the project hope to be implemented in order to create a strong foundation for the development. These uses were broken down into 3 major categories: live, work, and leisure. These 3 categories hope to match the in visions of the National Federation for the Blind, that being: independence, equal access to jobs, equal access to housing, transportation, and places of public accommodation.

The first program is for a Co-op Flex space anchored small scale Urban development. This development would site hybrid housing ranging from 1–3-bedroom low rise -apartments and duplex single-family housing to provide a versatile and diverse housing typology to the neighborhood, retail for leasing, a restaurant 'in the dark' themed restaurant in order to share and experience with the blind and visually impaired, a resource center comprised of a small library, collaboration and individual work spaces, computer labs, rentable workrooms for live work/ start up spaces. Bus stops and bus routes will be added to connect the site to the community and add transit to the area.

Co-Op Flex Space - Small Scale Urban Development w/ mixed use residential		
Program Criteria	**High 4-8**	**Low 1-3**
Access to information	**6**	
Access to diverse & affordable housing	**8**	
Access to Inclusive and diverse environment/ people	**8**	
Access to transit	**8**	
Collaboration		
Infant - 18		**3**
19 - 35	**7**	
36-59	**6**	
60+	**6**	
Shared Experiences		

Infant - 18	**5**	
19 - 35	**7**	
36-59	**6**	
60+	**6**	
Community Engagement		
Infant - 18	**7**	
19 - 35	**7**	
36-59	**8**	
60+	**8**	
Total		**106**

Table 3.1: Program criteria A

The second program is for a Library anchored small urban development. This development would site hybrid housing ranging from 1-3 bedroom low rise - apartments, different types of single family, and co- housing to provide a versatile and diverse housing typology to the neighborhood and provide the group living option, retail for leasing, a restaurant 'in the dark' themed restaurant for similar reasons, Large library, collaboration and individual work spaces, computer labs, rentable workrooms for live work/ start up spaces, and similarly bus stop and bus route will be added to connect the site to the community and add transit to the area.

Library Anchor- Urban Hub w/ Hybrid residential		
Program Criteria	**High 5-10**	**Low 1-4**
Access to information	**7**	
Access to diverse & affordable housing	**8**	

Access to Inclusive and diverse environment/ people	**8**	
Access to transit	**8**	
Collaboration		
Infant - 18	**6**	
19 - 35	**8**	
36-59	**6**	
60+	**5**	
Shared Experiences		
Infant - 18	**5**	
19 - 35	**7**	
36-59	**8**	
60+	**8**	
Community Engagement		
Infant - 18	**8**	
19 - 35	**8**	
36-59	**7**	
60+	**7**	
Total		**114**

Table 3.2: Program criteria B

With some or all these altered typologies in the area, the site can act as a catalyst for inclusion in the community, and in different scales duplicate in different highly visually impaired and blind populated cities.

Chapter 4: Precedent Analysis

In researching different precedents, it was rare finding one that embodied the overall goals of the potential development. It is not often that the built environment caters entire projects to targeted and underrepresented demographics. This pushed the precedent research to be program and typology driven. The considered presidents showcase a strategic combination of, or a strong foundation for a single typology that will be considered in the final design.

The Montrose Collective Development

The Montrose Collective is a mixed-use development with 4 buildings totaling in about 150,000 square feet of creative office and retail space.

Figure 4.1: Image of Montorse Collective

THe project received $104.75 million from construction financing and joint venture equity.

The development will have one six-story building with ground-level retail and restaurant space. The second-floor has medical office and service retail space, and the remaining levels house creative office space on the upper floors. In addition, the site will have a three-story retail building that occupies a new 10,000-square-foot branch of the Montrose Library on the upper floors. Overall, the project will offer retail frontage on four

streets, interstitial green spaces on the ground level, 100,000 square feet of office space, and both public and private parking.

Urban Hybrid Housing Development

MDRVD designed a hybrid housing development block that consists of 95 homes of 16 different varied types. It epitomizes characteristics of an ideal city dwelling such as: centrality, privacy, and access, while combining characteristics of the suburban life such as: gardens, multilevel living and community. The project is about 96,875 SF of housing, and about 31,484 sf of underground parking.

Regarding the housing typologies, the development consists of small apartment buildings at the corners, townhouses along the center block, and houses inside the block. The houses in the center of the courtyard have their own entrance doors at the outer perimeter of the block for privacy. The 16 different housing types are different in size varying between 320 sf to 1400 sf and could have between one and four floors. It was created with many options to attract a mixed and diverse group of inhabitants. To create a vivid and unique urban development, each house or apartment has its own façade color, which also emphasizes individual ownership. The pastel colors were chosen to mimic those traditionally found in historic Swiss towns.

Figure 4.2: Image of Urban Hybrid Housing Development

An important aspect of the project is the Construction and cost. The design idea was to combine high quality of construction with relatively low prices. Potential buyers will have the option of buying a basic model home, less finished through a range of additions to a more furnished model. This is a good alternative to home buyers or renters that may not be able to afford the initial investment, but want to work towards it on their own, while still starting in a new home. The interior of the block can be seen as a large central community space. It is divided by walls used to hang tables or benches and parts of the walls are used for table tennis. It has both private and public space, and a variety of fruit trees are planned to be planted in the courtyard, in both areas. The roofs will be used for additional outdoor space.

The Share House

The "share house, “is a co- housing style home in Japan, where the water systems, living room, kitchen and dining spaces are shared by the residents. The residents are not family and the social aspect is in managing the entire space and sharing spaces with one another. The shared and individual spaces were designed each with a different sense of comfort and access point in the central open space of the house.

Figure 4.3: Image of Share House

The entrance of the home is an atrium space that doubles as the dining space, which being the larger space in the home makes it great for gatherings, while the perimeter spaces by the windows are intended for individual use or small groups. The kitchen has island style countertop space that can hold a small group of people, and rug space on the 1st floor, which is popular in Japanese culture, is another space for public gathering. Having these spaces, the residents can use shared spaces to interact if they so

choose, outside of their individual rooms. As for the more private spaces in the home, the individual rooms vary depending on where they are placed in relation to the shared spaces.

The “Share house” has many rich shared spaces as well as larger bedrooms, at about 135 sf. This can compare a studio to one-bedroom apartment when considering an individual resident's portion of the shared spaces. When relating this to rents, it is possible to use a similar typology for this thesis, having individual rents and shared utilities.

Big Mouth House

The Big Mouth House was developed by Best Practice Architecture in 2018, and is a multi-family project that aims to redefine what multi-family living looks like. The project appears to be three townhomes that encompass one unit at 1,850 sf and two units at 1,420 sf in each. This means that every unit has a studio space, a main living area, and a rooftop deck at their own use. A stormwater management system is implemented, where they planted a bio-retention zone and both the pathway and parking area have pervious paving systems to allow water to pass through.

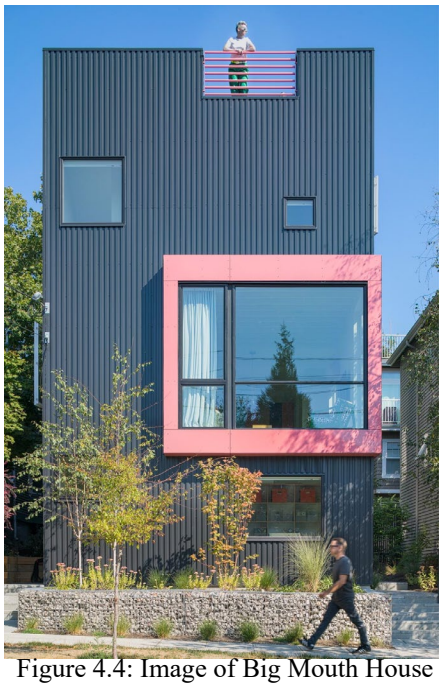


Figure 4.4: Image of Big Mouth House

A unique feature of the units is that all units have a lower-level income Accessory Dwelling Unit (ADU). These units are connected to the interior but have a separate entrance which allows for a flexible use to expand the home or as an independent apartment. In Units A and B, the ADUs are on the bottom level and have 2 entrances both inside and outside, as well as storage space. The second level has two bedrooms and a bathroom leaving the upper floor to have the living room, dining room, and kitchen. In

Unit C, the ADU unit, storage space, office area, and bike zone are on the lower level. Unlike the other units the kitchen connects to the dining and living room with a large floor-to-ceiling window on the mid-level and the Bedrooms, laundry, a guest bathroom, and the stairway to the roof are on the upper floor.

The designers aimed to offer an alternative to urban homeowners who crave the flexibility that is not typically available in traditional home design. This housing alternative could be useful in this thesis when studying and experimenting with multi-generational housing, co- housing, and mixed income housing.

Main Street

Main street is an inclusive apartment building and community center. It was founded in 2017 by Jillian and Scott Copeland, who took initiative in preparing for their 21-year-old son, Nicolas, who has developmental disabilities in the future. They knew that there were limited living options and community engagement opportunities for adults with disabilities, which led them to find long-term housing for Nicolas where he could thrive in life. Main Street offers a catalyst model that incorporates affordable housing opportunities with many social opportunities in an inclusive and welcoming environment.

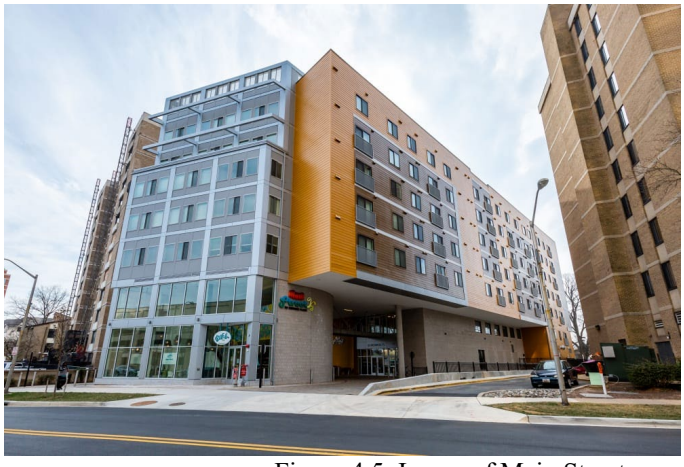


Figure 4.5: Image of Main Street

Scott Copeland, a principal with RST Development, LLC ("RST") assisted with the development of Main Street and the site is in Rockville, Maryland. The building consists of 70 units, 25% of which are set aside for adults with disabilities and the remaining 75% are

affordable housing options for anyone. The ground floor of the Main Street building has a 10,000-square-foot community center. This center houses a fitness center, teaching kitchen, multimedia room and a classroom. On the storefront of the building is: Soulfull Cafe, a coffee shop that provides an opportunity for employment to people with and without disabilities.

Main Street is not a service provider however residents and members are encouraged to bring with them whatever and whomever they need to help them fully access and enjoy the benefits of living at Main Street. Main Street Does offer residents the option to hire a Main Street Community Coach to provide limited types of assistance like those of a life coach. These coaches live in the building and have a specific set of responsibilities for assisting residents.

Main Street is founded on the core principles of affordability, inclusivity, and sustainability. It is a vibrant community for continued learning, social engagement and health and wellness and by doing so they hope to be much more than a building that benefits people with disabilities foremost a community that benefits people of all abilities.

Chapter 5: Site

Out of the many places in the U.S that are homes to schools and centers for the blind, Baltimore, Maryland is the location for the current headquarters of The National Federation of the Blind, the largest national organization for the Blind. To promote communities that are full of opportunities, they assist in providing programs, services, and resources that share information and support to blind individuals of all ages. Another local resource is The Maryland School for the Blind, a resource center for Maryland that strives to help blind and visually impaired students achieve independence. They provide communal, educational, and residential services to push each student to reach their fullest potential. With these services MSB hopes to prepare them to live independent and well-rounded lives and become active members in their communities.

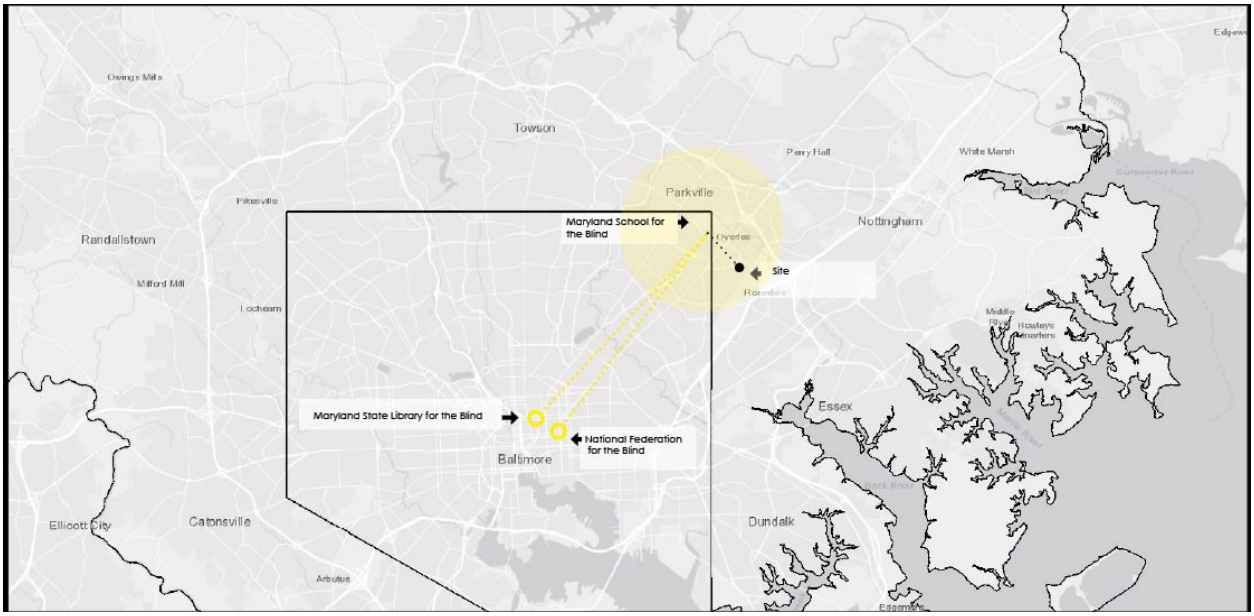


Figure 5.1: Maryland School for the Blind

Maryland school for the Blind's campus sits in a forested area that is surrounded by Each of the sites were critically examined to figure out which site was going to provide the best location to establish this program. I wanted to find out which sites reinforced the main ideas promoted in the overall design concept. To create a more detailed analysis of the initial categories, a mixed residential that is sandwiched between two retail strips. The school is for the

blind and visually impaired which makes inclusion with the sighted limited. The campus is also fully equipped with all needed resources making outsourcing not fully necessary. Knowing this posed a few questions. If the goal of this school is to prepare those with blindness and visual impairments to adapt and integrate into their communities, does this style campus suffice? Furthermore, can an adapted urban environment in partnership with MSB' services prepare them for assimilation post-graduation, during pre- graduation?

Using Maryland School for the Blind as a major resource, both demographic and service wise, the best place to place the site was in the immediate surrounding communities. This area is mostly developed, and is sprinkled with older neighborhoods that have homes dating back to the early 1900's. There are also some more recently built, low rise apartments that add to the mixture of demographic in the area. The need for a new diverse community anchor that connects neighborhoods, integrates demographics, and establishes a new cultural hub for the community.

The sites in Baltimore that were researched were both local to The Maryland School for the Bind. There were two sites, highlighted in yellow in Figure(xxx), that were good locations to

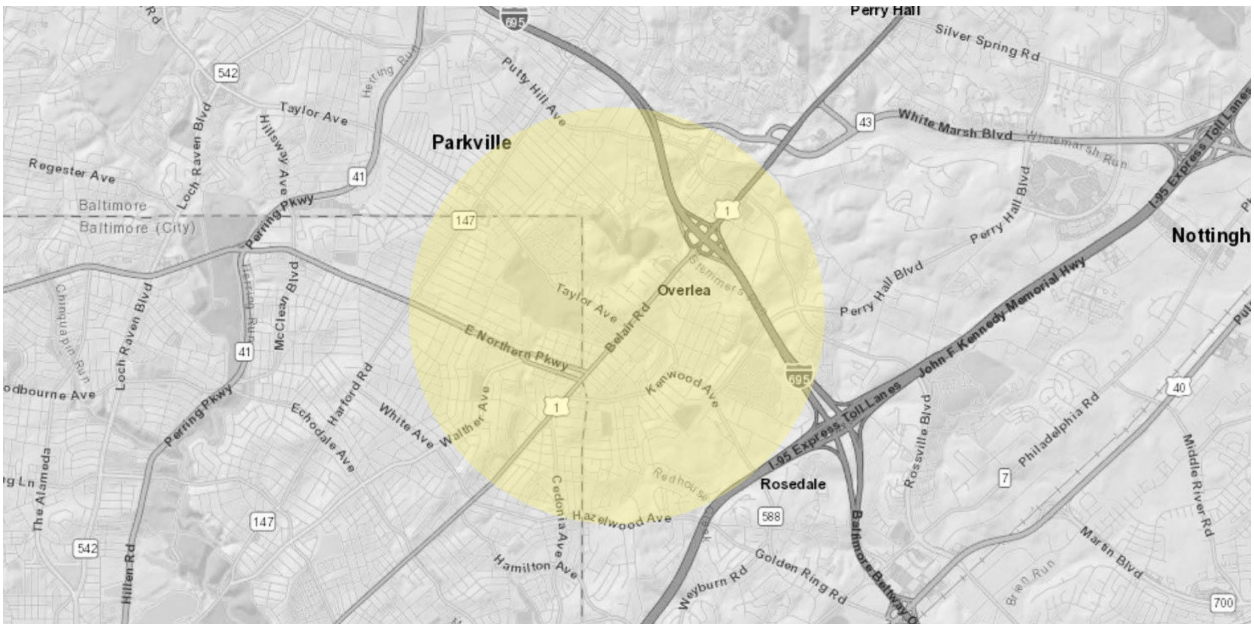


Figure 5.2: Sub market

house this type of development, while Maryland School for the blind is circled. Each site is within a mile of the school and are weaved into the heavy residential fabric. To help choose between the two, I created a matrix of criteria. This criteria consists of categories such as education, career building, Market analysis, demographic, safety, and transit.

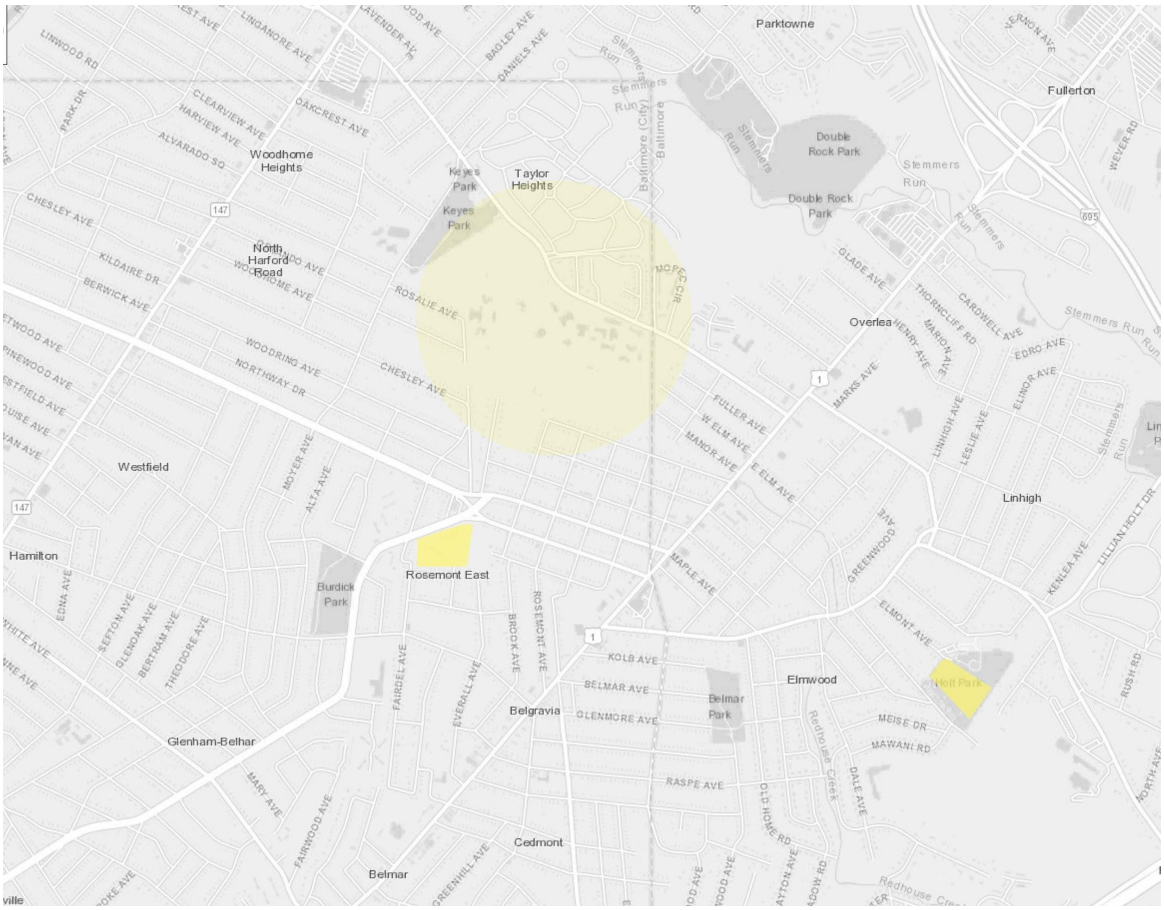


Figure 5.3: Potential sites

Each of the sites were critically examined to determine which site was going to provide the best location to establish this program. The important factor was to ensure that the sites reinforced the main ideas promoted in the overall design concept. To create a more detailed analysis of the initial categories, a breakdown of each category was added. Under these qualifications, the site would already have or would benefit from the added program.

Site A

6607 Walther Ave, Baltimore, MD

Site A is currently an existing low rise apartment complex, with studio- 2-bedroom units. They start at 650 Sf and cost between $814/m - $923/m. It currently has a low vacancy rate with one unit available showing its popularity and affordability. The site is a total of about 164,000 sf and would need to go under demolition to start construction of a new building.

Figure 5.4: Site A

This site sits right off of Walther Ave and is surrounded by mostly single - family residential and low-density apartments. Out of the two sites it is closer to Maryland School for the Bind, as well as other existing retail strips. Using this site would displace the current residents and call for compensation, ending in extra expenses.

Site Criteria	**High 5-10**	**Low 1-4**
Education	**5**	
K-12	**8**	
Higher Education		**4**
Career Building/ Job Training		
Local Resource Center (1-10 mi)	**7**	
Places to Work	**5**	
Market Analysis	**5**	
Diverse Income	**5**	
Demand for new development		**4**
Demographic	**8**	
Diverse ages & races	**6**	
Large Blind/ visually impaired population	**8**	
Safety		**4**
Walkable		**3**
Lighting		**4**
Transit	**6**	
Access to local transit	**5**	
Parking	**8**	
Total		**95**

Table 5.1: Site Criteria A

Site B

|Elmont Ave, Baltimore, MD|

Site B is currently an empty, forested lot, in a single-family neighborhood. It is directly next to Holt Park Center for the performing arts and around 0.8 mi from Maryland School for the Blind. It is currently zoned DR- 1 and is proposed for DR-5.5 and RAZE. Being a site zoned for demo, makes it an opportunity zone for future development.

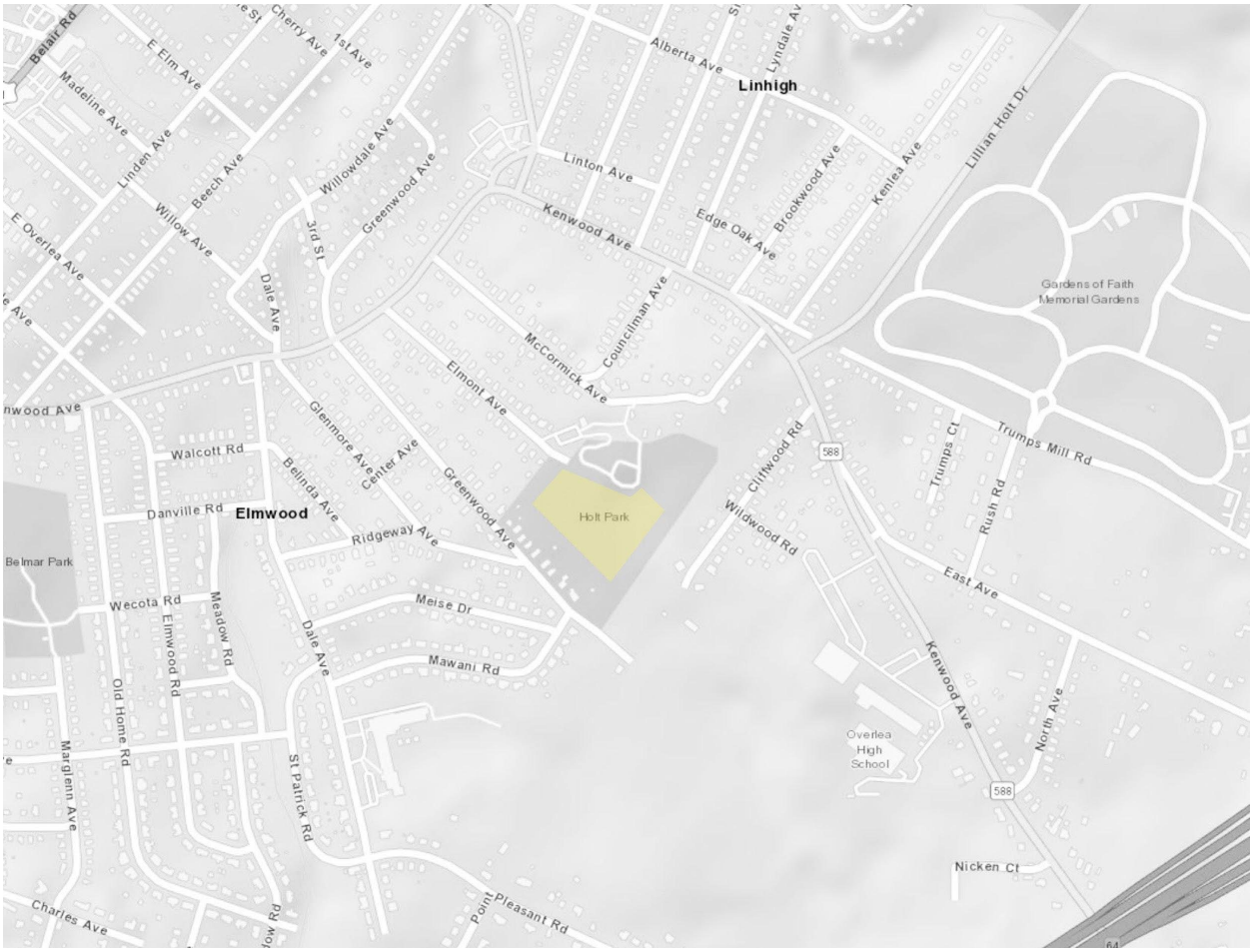


Figure 5.5: Site B

Site B is a seemingly dead-end lot, being the center of three neighborhood dead ends. It is near a retail street and sits in the center of the community. This site is embedded in a dense residential fabric, making visibility an issue. This site does however can be the missing piece to the

neighborhood puzzle and connect them. Having the performing arts center and park as a neighboring land use, can drive both new and existing people to the new site.

Figure 5.6: Site

Site Criteria	**High 5-10**	**Low 1-4**
Education	**7**	
K-12	**9**	
Higher Education		**4**
Career Building/ Job Training		**4**
Local Resource Center (1-10 mi)	**5**	
Places to Work	**5**	
Market Analysis	**7**	
Diverse Income	**6**	

Demand for new development	**8**	
Demographic	**6**	
Diverse ages & races	**5**	
Large Blind/ visually impaired population	**9**	
Safety	**6**	
Walkable	**6**	
Lighting		**3**
Transit	**5**	
Access to local transit		**3**
Parking		**N/A**
Total		**104**

Table 5.2: Site Criteria B

Site Selection

Site B seems to provide a better overall environment and location of the two options. With little to no new construction in the area, any new development will become a point of interest and traffic will be increased for new retail tenants. Having the performing arts center and park as a neighboring land use, can drive both new and existing people to the new site. The site as is, is completely forested

Figure 5.7: Vegetation

with a figure 8 shaped path throughout. In addition to concerns of disrupted amenities, the element of forestation becomes a question. Zoning the lot itself to have a build-able zone and untouched zone can help ensure a percentage of the forest element remains; however, the size of the development footprint may not permit this. These deforested trees, however, can be used later during construction, for they can be traded to a manufacturer for new wood to be used. These trees will begin to act as buffers for the surrounding neighborhoods as well as keep in the spirit of the natural environment. With neighbors on Greenwood Ave putting up fences to enclose their house from the park, shows the desire for privacy that will need to be respected upon development. Previously being a nature park there is a rich multi-sensory experience that comes with this site that is unavailable in the site A option, with as a key driver in site B being chosen.

Chapter 6: |Master Planning|

When considering the master plan for this thesis, besides considering the site, the users must too be considered. While many uses of the development will be sighted, it is assumed that this development will be accessible, livable, workable, and enjoyed by all. Implementing different design ideals that can enhance the environment for populations not always accounted for in design can create a ripple effect of successful and vividly rich communities. With the preferred site being near Maryland School for the Blind, as well as other amenities and institutions that draw in the targeted audience including: 1. Holt Park, 2. Overlea High School, 3. Elmwood Elementary and 4. dense residential fabric, this development can become a location that mixes users and can be used for orientation and mobility training. By using universal design, sensory design, and navigation tactics to influence the design moves in this thesis, this urban development can become a great micro- community.

Figure 6.1: Amenities and Institutions

Universal Design

The ADA act defines universal design as" ...the design and composition of an environment so that it may be accessed, understood, and used as follows:

- "to the greatest possible extent
- In the most independent and natural manner possible
- In the widest possible range of situations
- Without the need for adaptation, modification, assistive devices, or specialized solutions, by any persons of any age or size or having any particular physical, sensory, mental health or intellectual ability or disability.

When considering Universal Design in a project it has the option to incorporate what is called a "two level approach". These approaches are "user-aware design" and "Customizable Design". When applying user- aware design, you are" pushing the boundaries of 'mainstream' products, services and environments to include as many people as possible." When applying customizable Design, you are using tactics that "minimize the difficulties of adaptation to particular users." Universal design can also be looked at in differing scales. Micro scale can be an example of a single design feature or product that is to be designed to be used by as many people as possible. In opposition, the Macro scale can be an example of more specialized design solutions that deal with the larger usability issues.

At the Micro scale, the designer is not expected to find the one size fits all design, but more so design solutions that are inclusive without compromising the integrity or quality of the product. For example, a lever handle might be better overall than a doorknob since the lever handle can be opened using the elbow or a closed fist and more verses just the twist option. At the Macro scale, the designer is to look at a larger range of accessibility issues such as access to information. An example could be including a user-friendly website that meets web accessibility initiative's,

A useful list of criteria to use when designing is the ”7 Principles of Universal Design”. This list was developed in 1997 by many industry professionals including: architects, product designers, engineers, and environmental design researchers. The Intended results of the Principles were to simply establish a guide that can help the design of environments, products, and information. According to the Center for Universal Design in NCSU, the Principles "may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments."

The 7 Principles come with both an initial rule and is completed with a list of guidelines. The principles are as follows:

- Principle 1: Equitable Use- where the design is useful and marketable to people with diverse abilities.

This means that a place provides the same means of use for all users, avoids segregating or stigmatizing any users, privacy, security, and safety should be equally available to all users and the design should remain appealing to all users.

- Principle 2: Flexibility in Use - where “the design accommodates a wide range of individual preferences and abilities.”

This means the design is to provide choice in methods of use, accommodate right- or left-handed access and use, facilitate the user's accuracy and precision, and provide adaptability to the user's pace.

- Principle 3: Simple and intuitive use- which means the use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

To accomplish this is it ideal to eliminate unnecessary complexity, be consistent with user expectations and intuition, accommodate a wide range of literacy and language skills, arrange information consistent with its importance, and provide effective prompting and feedback during and after task completion.

- Principle 4: Perceptible Information - which ensures that the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Ways to achieve this is to use different modes (pictorial, verbal, tactile) for redundant presentation of essential information, provide adequate contrast between essential information and its surroundings, maximize "legibility" of essential information, differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions), provide compatibility with a variety of techniques or devices used by people with sensory limitations.

- Principle 5: Tolerance for Error- which refers to the attempt to have designs minimizes hazards and the adverse consequences of accidental or unintended actions.

Some ways to achieve this is to arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded, provide warnings of hazards and errors, provide fail safe features, discourage unconscious action in tasks that require vigilance.

- Principle 6: Low Physical Effort - which promotes efficient and comfortable transit that has a minimum of fatigue.

Ways to achieve this can be to Allow users to maintain a neutral body position to use a product or exist in a space, use reasonable operating forces, minimize repetitive actions, minimize sustained physical effort.

- Principle 7: Size and Space for Approach and Use - which enforces spaces have the appropriate size and space provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Ways to do this are to provide a clear line of sight to important elements for any seated or standing user, make reach to all components comfortable for any seated or standing user, accommodate variations in hand and grip size, provide adequate space for the use of assistive devices or personal assistance.

The use of Universal Design can create inclusive design solutions as well as promotes independence by means of accessibility and usability for people with all levels of ability. A person having independence can be influenced by how accessible and usable products, services and environments are. Technological innovation has increased, making it less likely for someone to be excluded from accessing a whole range of financial, state, social or cultural services or amenities. By using universal design in environments will ultimately promote equality, ease, and safety for everyone.

Orientation & Mobility Training

When it comes to the blind and visually impaired, movement is a building block for learning. People with visual impairments begin with mobility training because they typically need encouragement to explore their surroundings, which is understandable. Orientation and mobility training is used to help a blind or visually impaired person know where they are and want to go in space;(orientation, as well as help them establish a plan to get there (mobility). You should start to develop orientation and mobility skills as a young child, starting with basic body awareness and movement, and should continue into adulthood when learning to navigate the world efficiently, effectively, and safely.

Some strategies used when planning an orientation & mobility program for children, training may include:

- Sensory awareness
- Spatial concepts
- Searching skills
- Independent movement
- Sighted guide
- Protective techniques
- Cane skills

When a person cannot use their vision to understand their surroundings, they must learn to use his other senses more effectively. Systematic instruction is taught to develop the other senses for navigation of the environment. They learn that the use of sounds, smells and textures can be used as permanent landmarks in the world. Developing sensory awareness is critical for a

person with visual impairments or blindness. Individuals must learn to localize sounds and use sound clues for orientation, straight line travel, and safety. Independent movement is critical for all individuals with visual impairments. Orientation and Mobility specialists are trained to provide instruction that can help people with visual impairments to achieve independence.

Chapter 7

|Design Guiding Principles|

In completing the personal experiment, it was hoped that information gathered from experiencing can help drive my design decisions. A list of design principles was created from the results of this experiment. These principles include: Edge & Materiality, Path & Distance, Light & Contrast, Enclosure & Exposure, Verticality and Horizontality, and multi-sensory environment. By implementing these principles in the design process, it can help increase the navigability of the site in question.

Edge & Materiality

In the Personal Experiment, when walking on sidewalks, in hallways, and corridors, there was a tendency to veer off the supplied walking path. It could have been helpful to have a type of boundary/ warning to imply change of path, change of materiality, and edge of path.

Edge diagram general

Edge & Materiality begins to use boundaries to ensure safety, orientation, and change in surface. This design principle will allow the visually impaired pedestrian a warning when approaching things to the sides of them as well as potentially prevent them from walking into shelves, grass, and other dangers, as well as help to use the material change as indicators that something has changed in orientation or surroundings.

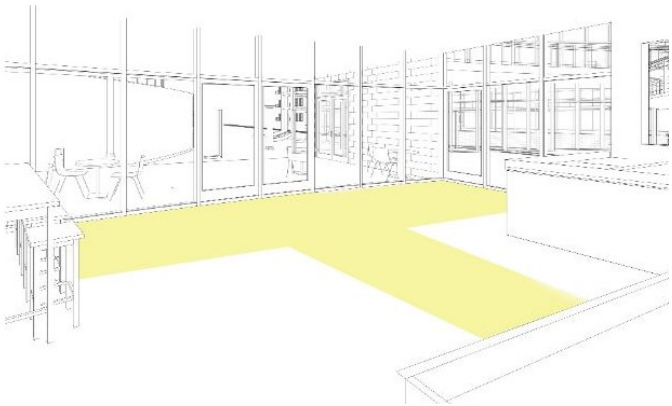
Edge diagram Design

Path & Distance

In the Personal Experiment, when walking It was hard to understand how far that I had traveled. The visually impaired often count objects in their surroundings such as light poles, trees, and columns to help with this understanding of distance, however indicators on the path itself can help quicken this process. Pathways are also more useful to the blind when they are wider. This can ensure that a cane and/or guide dog can be used comfortably in passing with other pedestrians on the same sidewalk.

Path diagram general

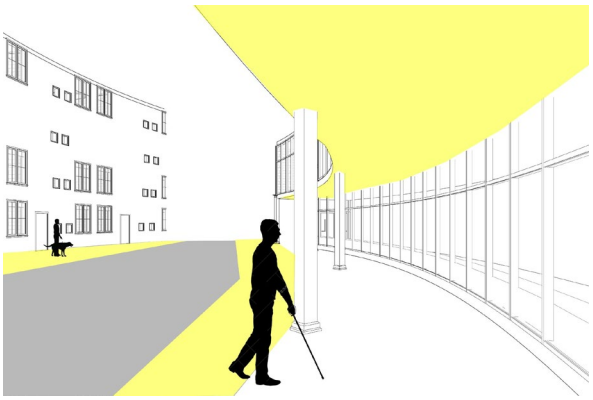
Path & Distance begins to use surface warnings at specific distance measurements that can indicate distance traveled. Paths should be direct and wide to accommodate multiple users at a time and reasonable space for pedestrians to not only walk in groups but also use equipment needed for navigation. This design principle will allow the visually impaired pedestrian to understand how far they have traveled, when entrances to doors arise and gives ample space to navigate and understand their surrounding when traveling a particular path.



Path diagram Design

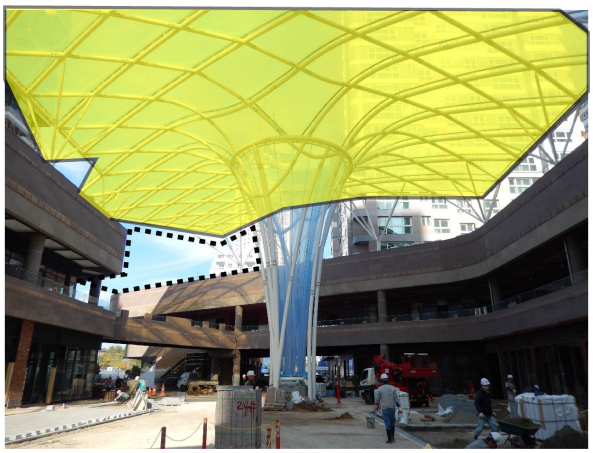
Enclosure & Exposure

In the Personal Experiment, when walking in interior spaces that were outside it was nice to feel the sun on my skin so that it is understood that I was still outside. I was also able to see the light difference as I passed columns or trees in passing.



Enclosure diagram general

Enclosure & Exposure begins to use the sun as a factor in understanding a person is relative to a surrounding building. The enclosed feeling that comes from standing under an overhang is very evident both in temperature, but also sound. Exposure uses the sun directly for it indicated direct access to the natural elements.



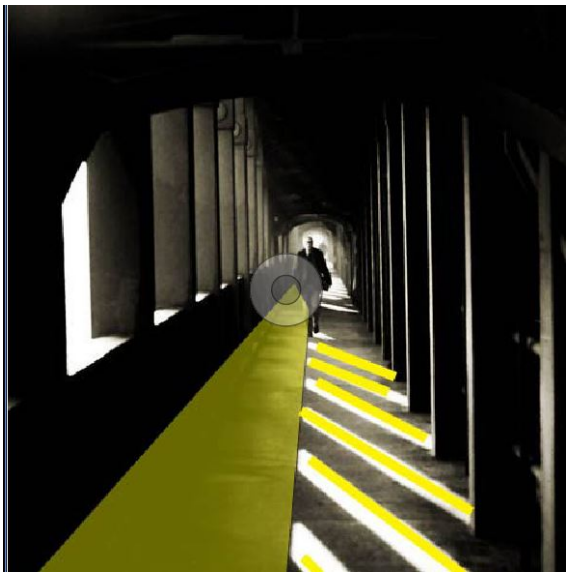
Enclosure diagram design

Light & Contrast

In the Personal Experiment, when walking in interior corridors that were glassed on one side and solid wall on the other, gave a unique experience. It was a clear warmth and brightness on half of my face. This was often the case in public spaces. This helped me to understand not only that I was close to the exterior of the building, but also that I was likely in a lobby type space.

Light diagram general

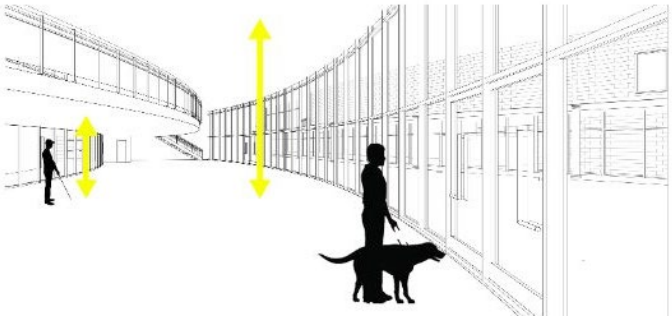
Light & Contrast begins to use light to understand placement in a building. In spaces that are inward, it was likely darker, and no sun was affecting my bodily temperature. Light & Contrast can also speak to material colors and selection in all spaces. The contrasting colors help to distinguish different changes. This helped to orient me overall when I was out in public.



Light diagram Design

Verticality & Horizontality

In the Personal Experiment, it was very easy to tell when I was in a larger public space verses a smaller intimate space. This was mostly due to the evident acoustical change and materiality difference.



Light diagram Design

Verticality & Horizontality begins to point out how taller ceiling in public places and lower ceilings in smaller spaces can help a visually impaired person understand the building typology. By using eco location as a tactic surrounding types are easily identifiable.

Light diagram general

Multi-Sensory Environment

In the Personal Experiment, it was a surprise to me, how much I ended up relying on my other senses. Having 20/20 vision my first sense in understanding my surroundings would be my sight. The other 4 senses became very important in maneuvering the everyday spaces.

Light diagram Design

Multi-sensory environments ensure that orientation is heightened with sound, smell, touch, and potentially even taste. Remembering or understanding where I am based on a sense will begin to indicate landmarks in a location for future reference.

Light diagram general

Chapter 8
| Design Process|

|Scheme 1: The L.E.N.S|

Scheme 1

Scheme 1 is entitled “The L.E.N.S” which stands for Livable, Equitable, Navigable, and Sensory. This scheme investigates a building form that resembles a camera lens and how the different program would enclose a circular center courtyard. The residential program faced the existing residential properties, and the institutional and retail programs faced the existing amenity and new road that would be brought to the site. The water feature ran through the site as it existed previously on site and the nature trail was placed wrapping the lot.

This scheme while embodied a key metaphorical concept that could be successful for this development, was not successful in orientation since the circular motion was too repetitive and could become more confusing than beneficial.

|Scheme 2: The I.R.IS|

Scheme 2

Scheme 2 is entitled “The I.R.I.S” which stands for Independence, Resilience, Inclusivity, and Serenity. This scheme investigates a building form that resembles the eye, specifically the iris and how the different program would similarly enclose a circular center courtyard. The program followed the form of the building in the circular motion and the water feature ran through the building and through the center courtyard.

This scheme embodied a key metaphorical concept that continued to the final design and was a successful theme for this development, however similar to scheme 1 was not successful in orientation since the circular motion was too repetitive and could become more confusing than beneficial.

|Scheme 3: The Rustic Iris|

Scheme 3

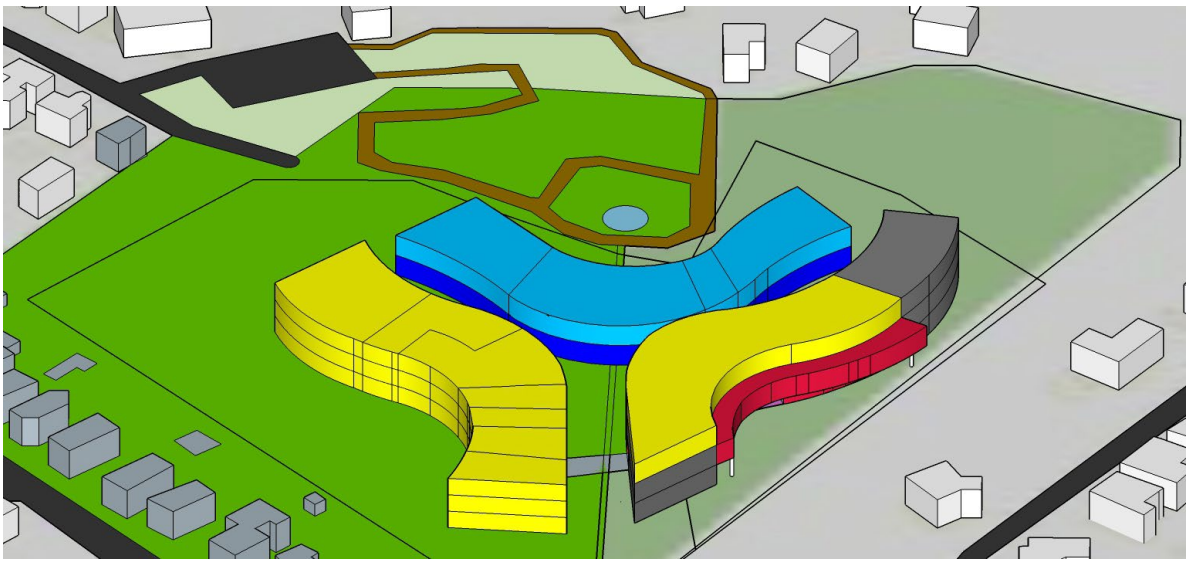
Scheme 3 is entitled “The Rustic Iris” which embodies the similar idea of “The Iris” but instead of the anatomy concept of the iris, the nature meaning of the word iris is used. The site is also wooded, with cabin style homes on site, which promoted the idea of rustic. This scheme investigates a building form that resembles that of an iris flower and how its petals concave and convex. This allowed for the different programs to extend in various directions on site a reach out into the surrounding context. In this iteration, the water feature ran through the site as it existed previously on site and the nature trail was placed wrapping the lot.

This scheme was successful in potentially directing users to each “limb” of the development. Through iterative process the scheme developed and simplified to include a central courtyard as well as organize the program more strategically to ensure direct passage between buildings and lead used to specific point on the site.

Scheme 3 iteration 2

Iteration 2 of Scheme 3 broke the initial form into 3 forms that spread across the lot. In this scheme the institutional building fronted the existing park, the commercial building faced the new street, and the residential building is exploded to emphasize the different residential types that could exist on site.

This exploration was successful in program placement, however the residential portion as well as the curved forms needed purpose and uniformity.



Scheme 3 iteration 3

This final iteration of scheme 3 began to finalize the building form and placement on the site. It aligned new program to existing programs in the surrounding context, enclosed a central courtyard that had 3 distinctive and direct exits, that directed the user to specific and important landmarks on the site including the nature trail, the pond, and the bus stop. The cures needed refinement and precision however this iteration drove the final form of the building.

Chapter 9: |Final Design|

This final Scheme is called “The IRIS” embodying the same goals as the original “I.R.I.S” promoting: Independence, Resilience, Inclusivity, and Serenity. The development goals are to ensure that the everyday notion of live work and leisure are found on site. These ideals correlate with the those of the National Federation of the Blind, which are to “live independently, have equal access to jobs in the Civil Service and elsewhere where blind candidates had been prohibited from applying, and equal access to housing, transportation, and places of public accommodation”.

In implementing these ideals, the development needs to be pedestrianized, transit-oriented, and economically viable. Some tools to pedestrianize the site are to:

- Allow for ground level access
- Ensure direct sidewalks and paths
- And create a lifestyle oriented development

Tools to ensure the site is transit- oriented are to:

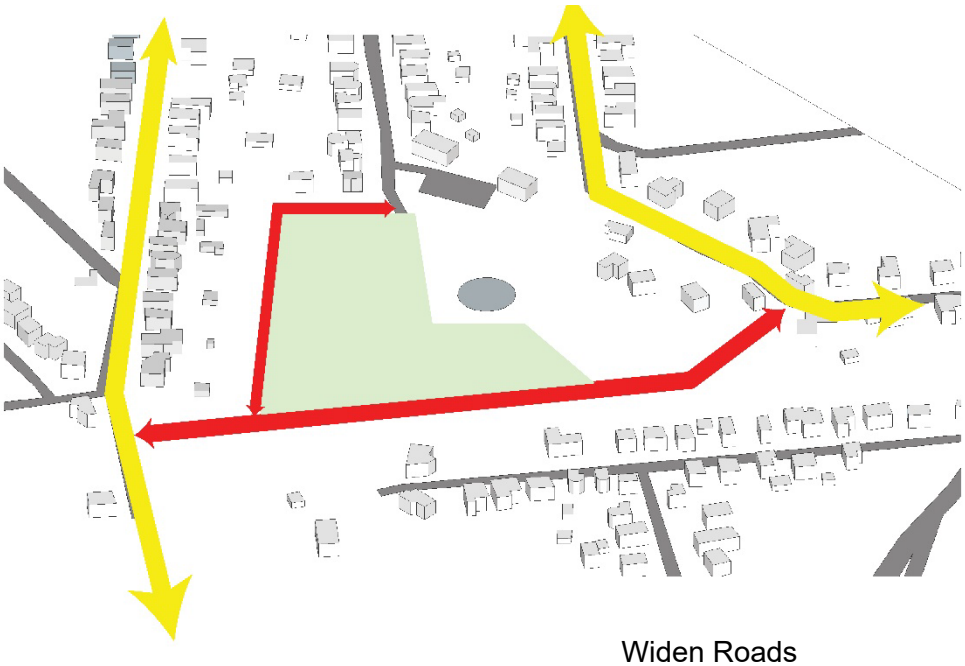
- Make the site walkable
- Add a direct and close bus stop
- Connect the streets and widen sidewalks

Tools to ensure the site will be economically viable are to:

- Ensure access to readable information for all
- Employment opportunities for all
- Career/ life development
- Diverse housing options
- Diverse incomes and demographic

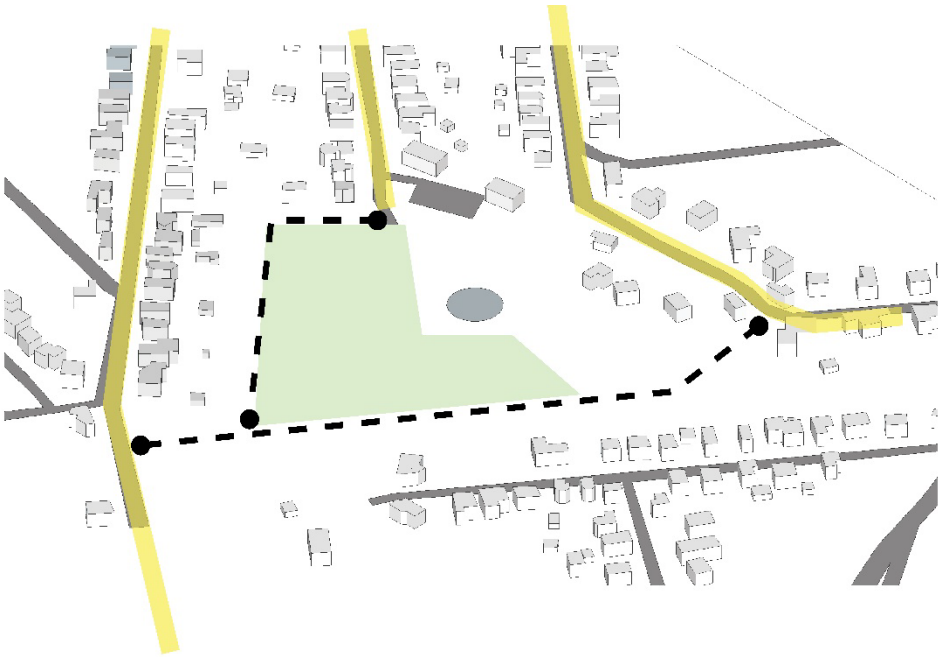
- Accessible units
- Development is able to adapt and change over time as future needs arise

Pedestrianize



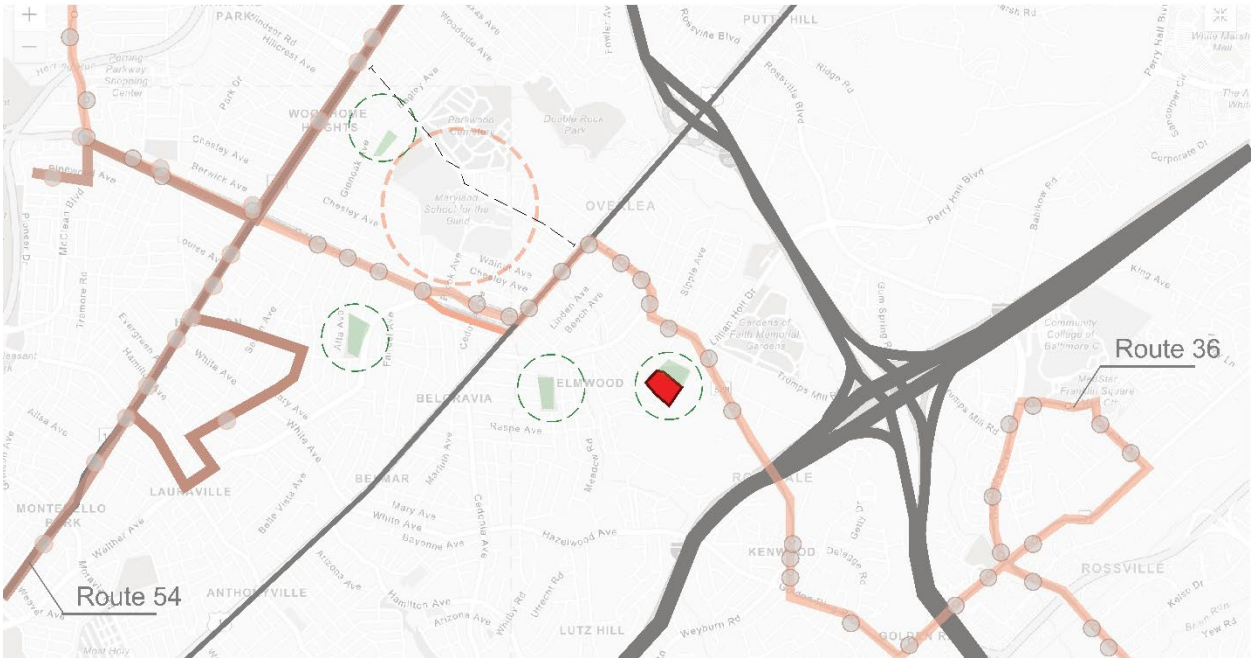
Widen Roads

-

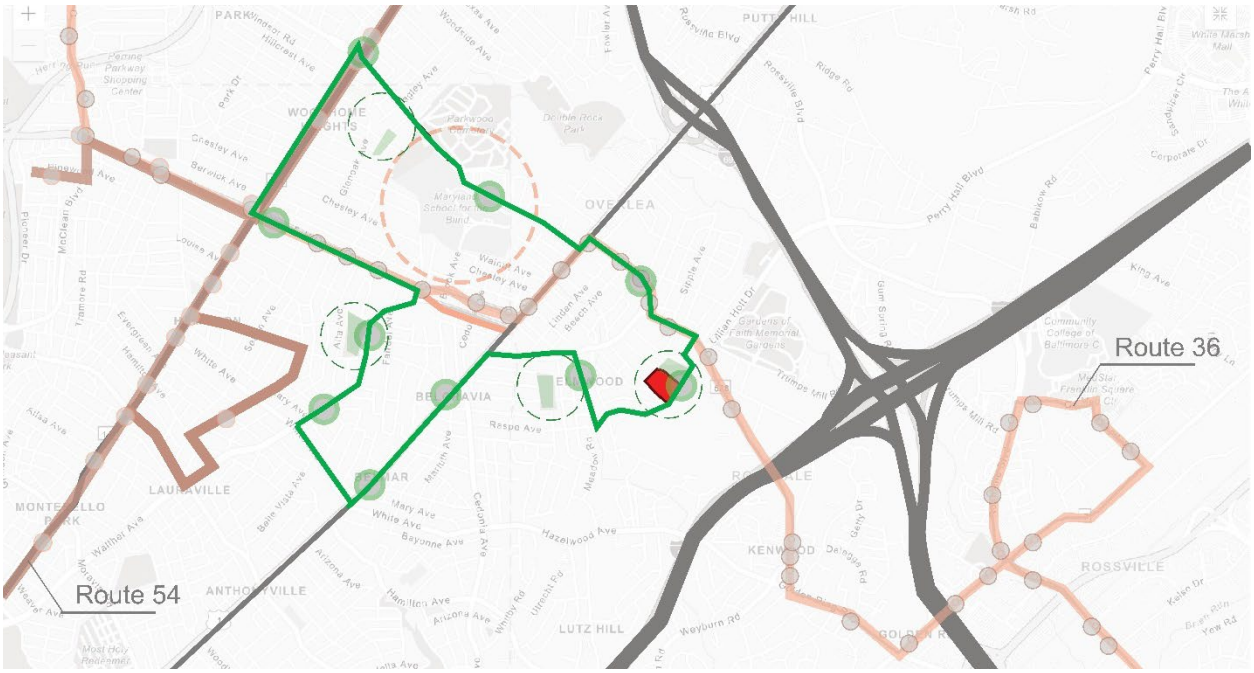


Connect Neighborhoods

Existing Routes

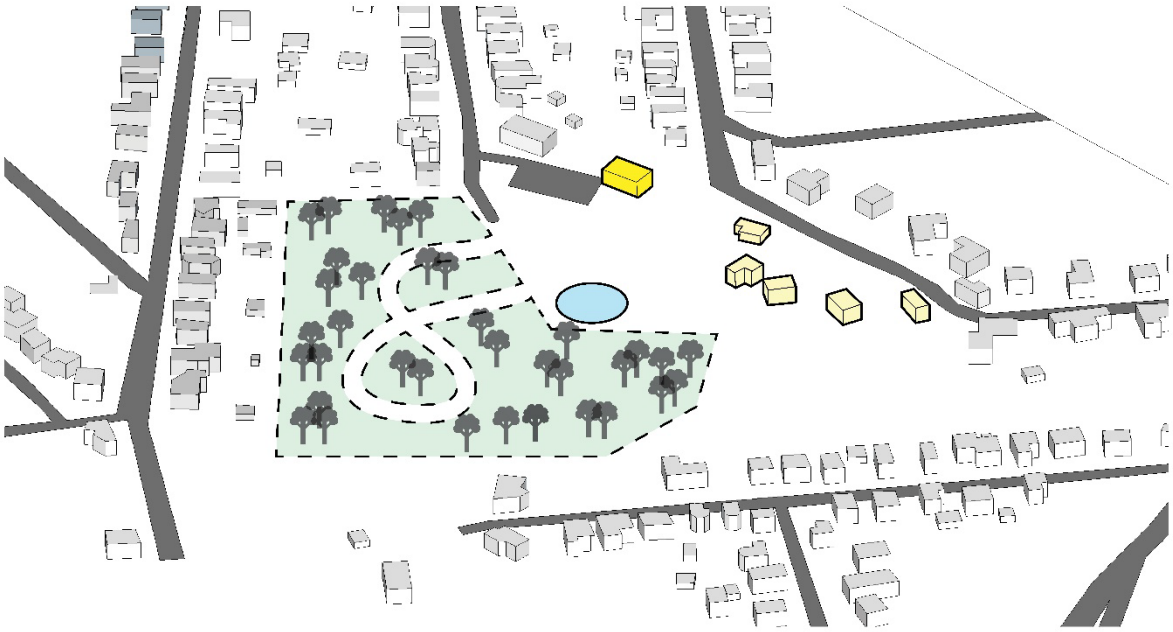


Disconnect

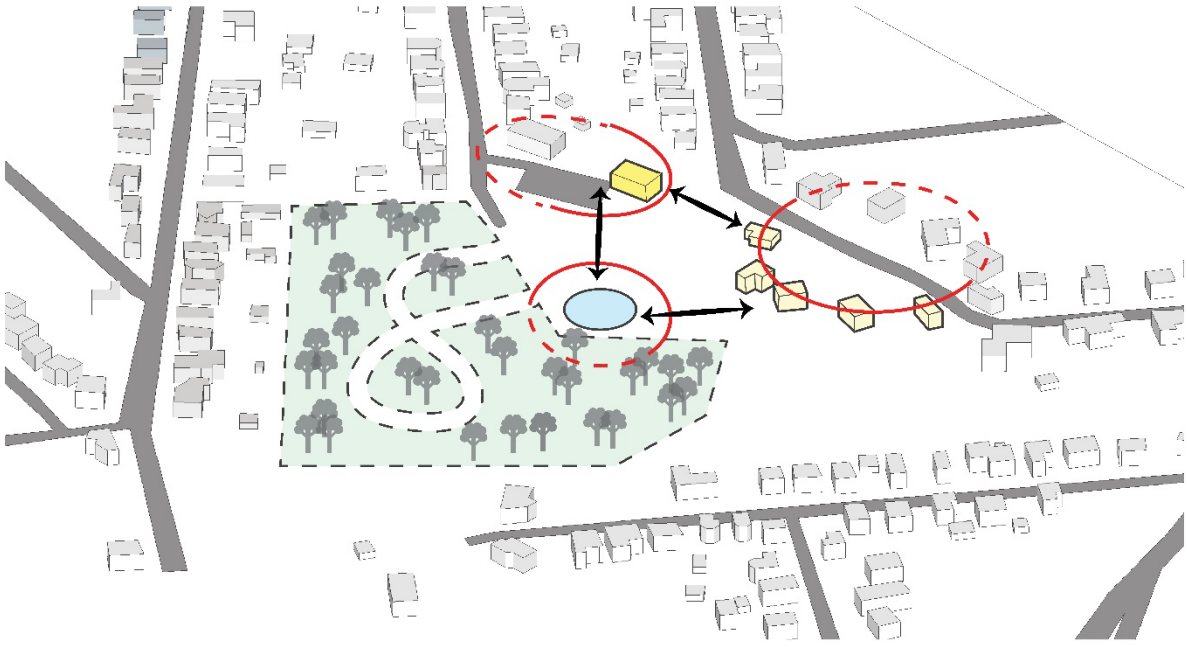


Proposed Route

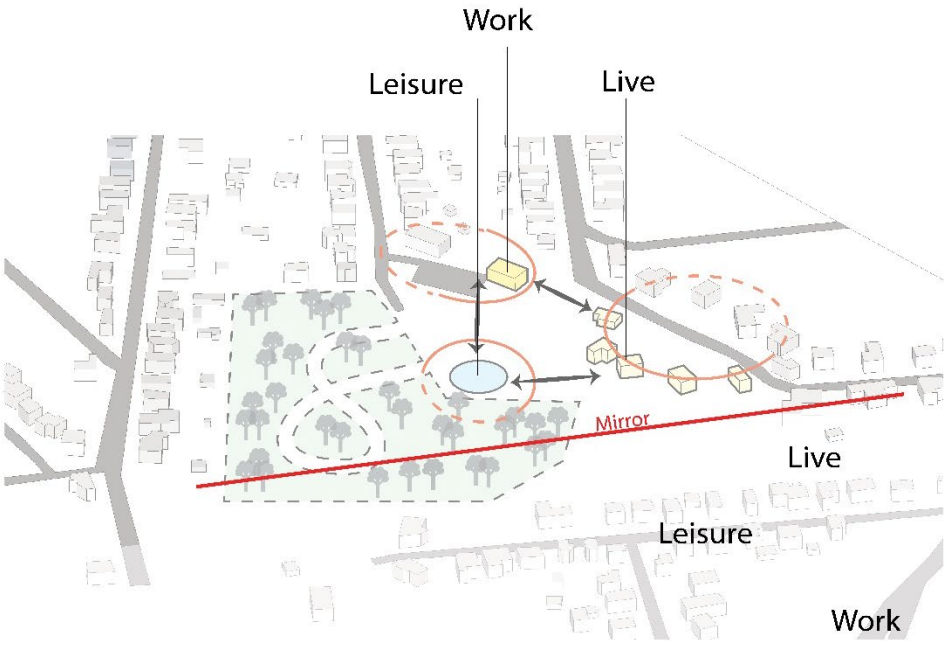
Economically viable



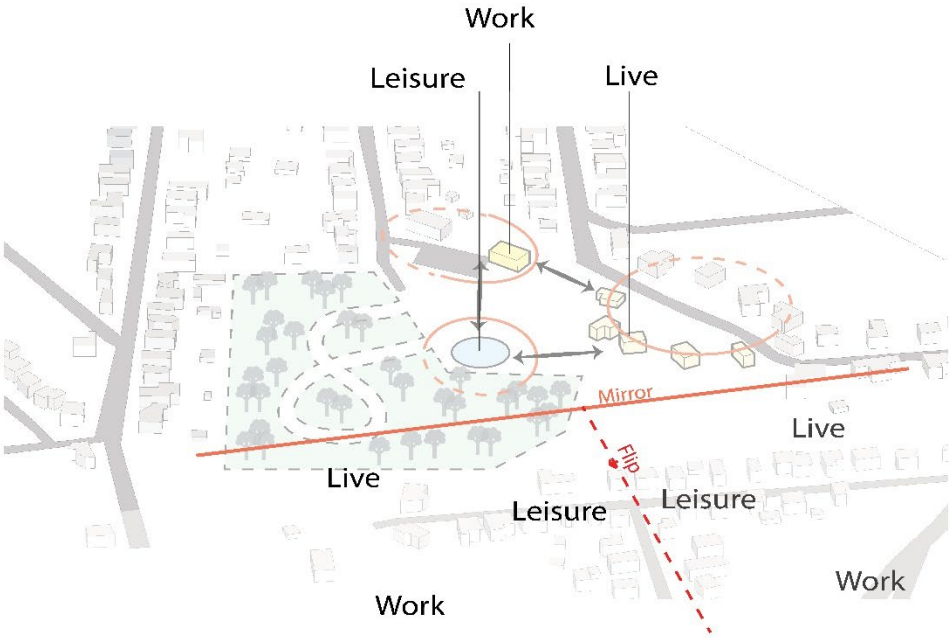
Existing site



Site categories


Work
Leisure
Live
Mirror
Live
Leisure
Work

Mirror


Work
Leisure
Live
Mirror
Live
Flip
Live
Leisure
Leisure
Work
Work

Flip

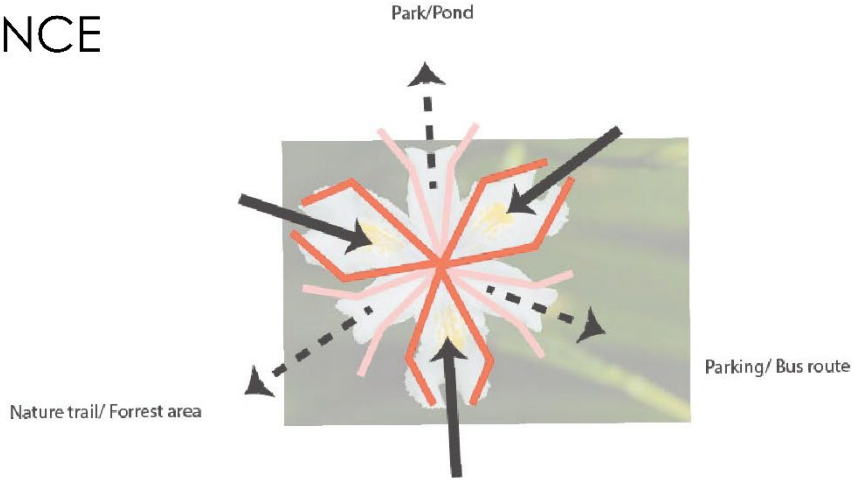
Opportunity Zone

I INDEPENDENCE

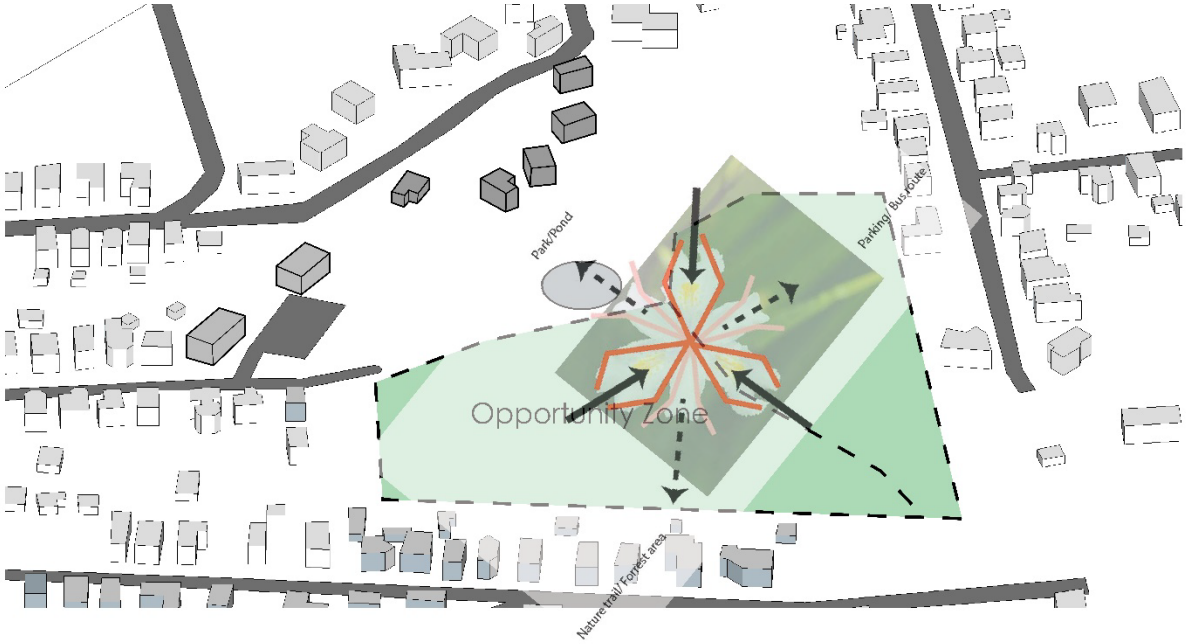
R ESELIANCE

I NCLUSIVITY

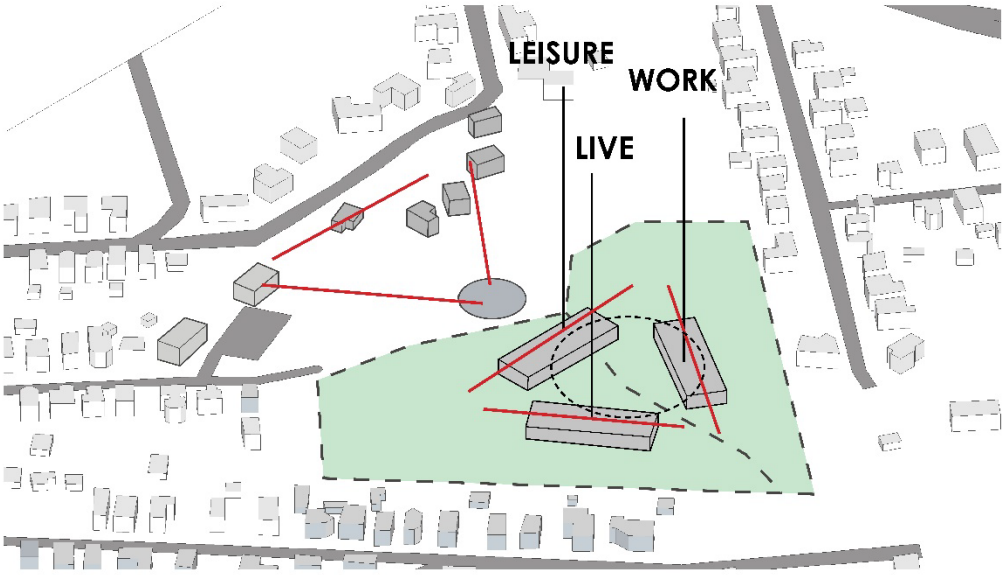
S ERENITY



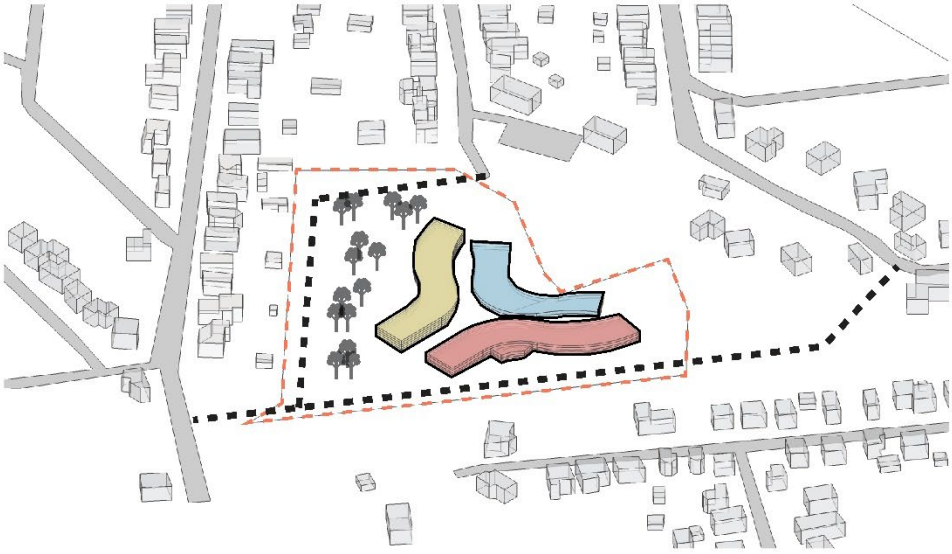
Concept



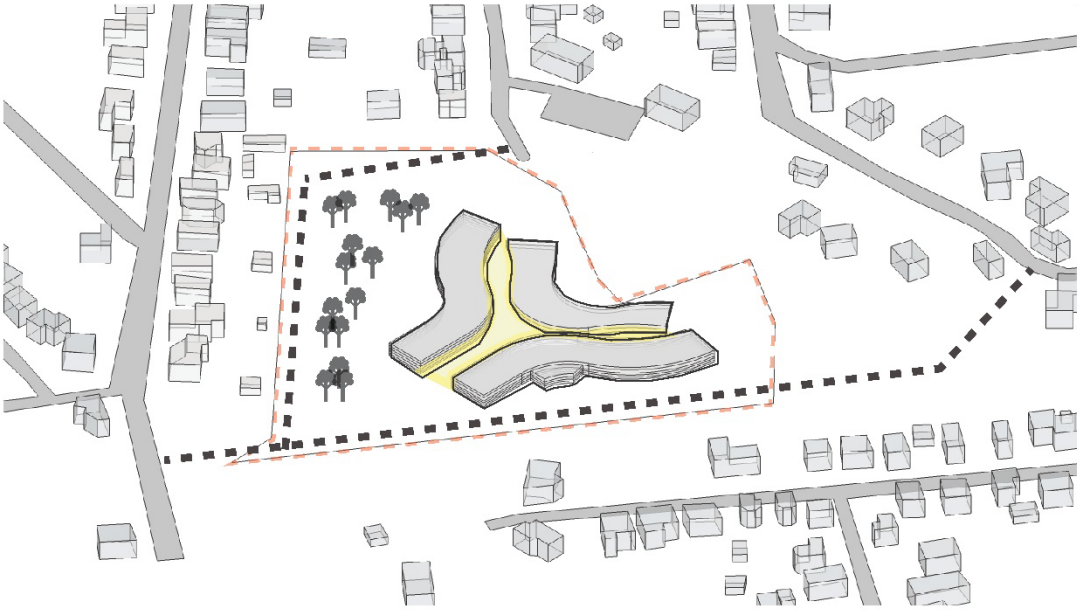
Superimposed



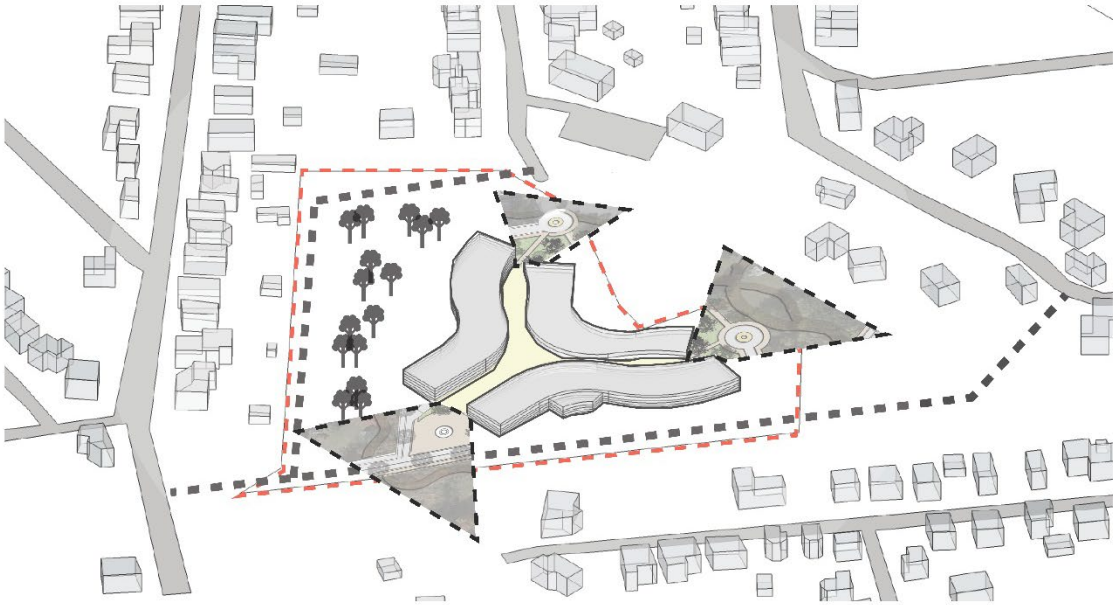
Circular concept Implemented



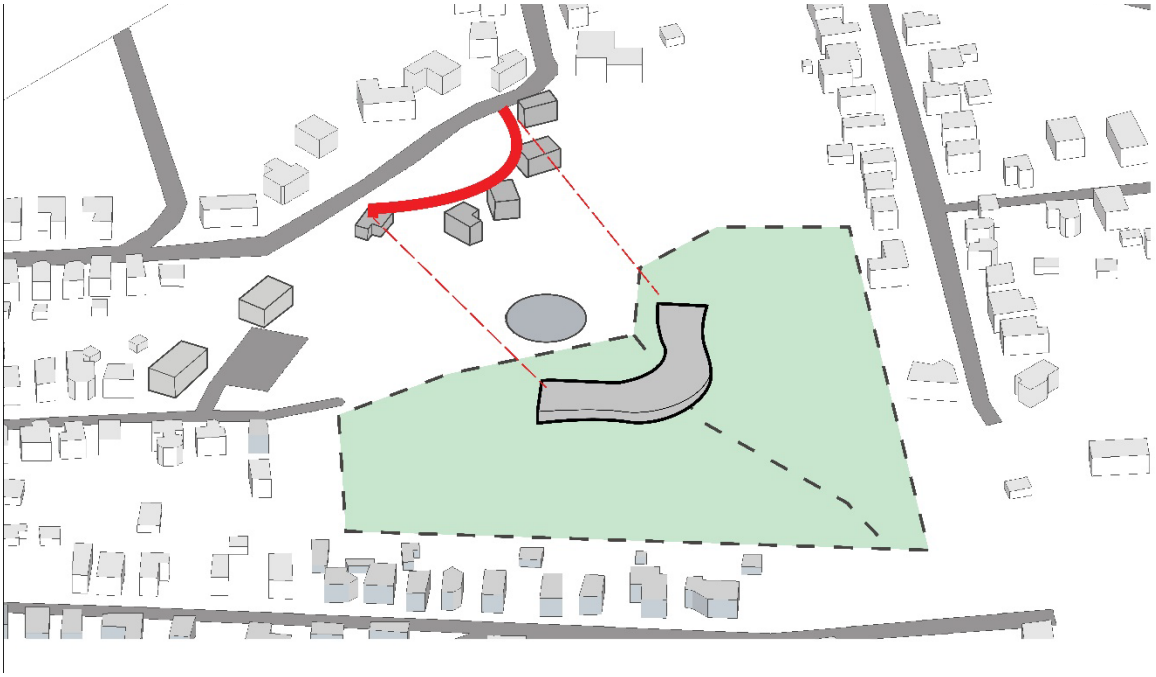
Live work Leisure



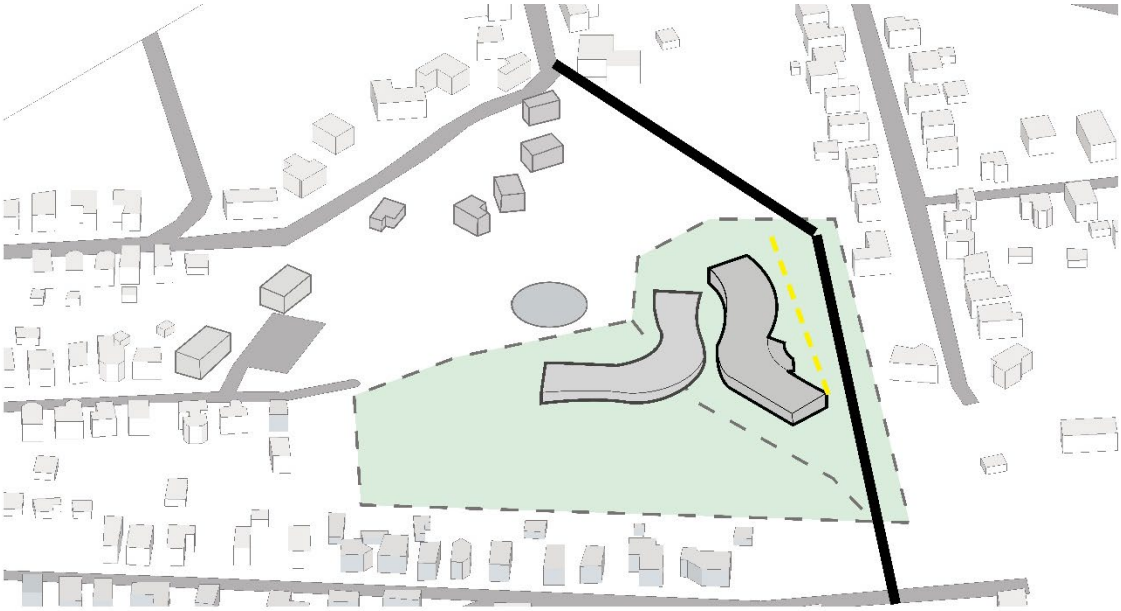
Courtyard



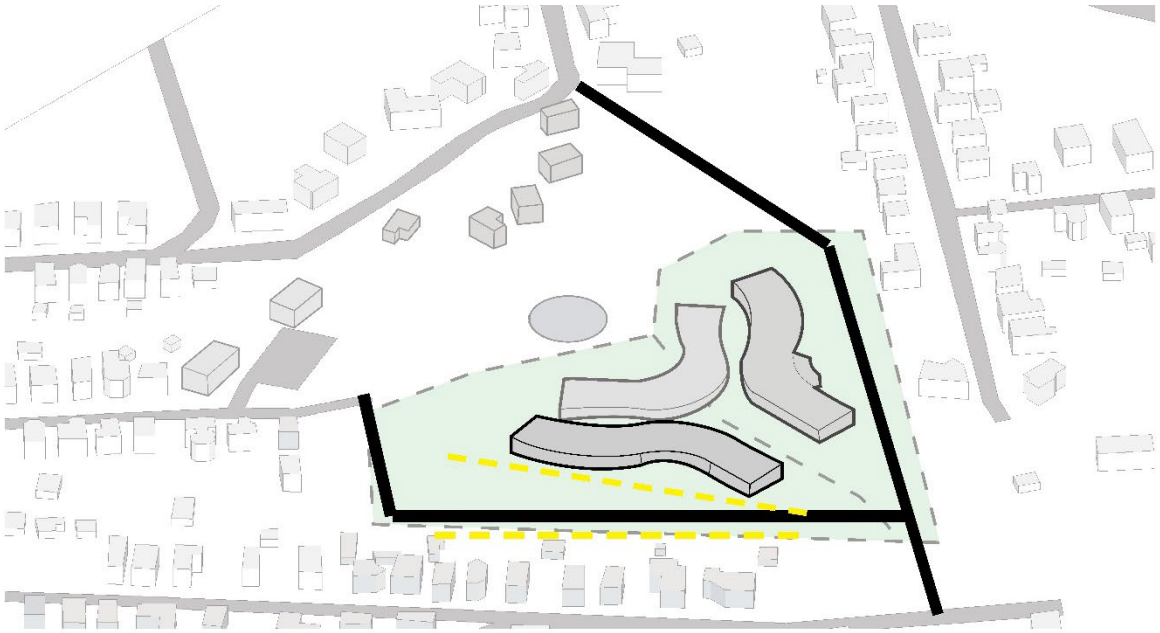
Landmarks



Curved form



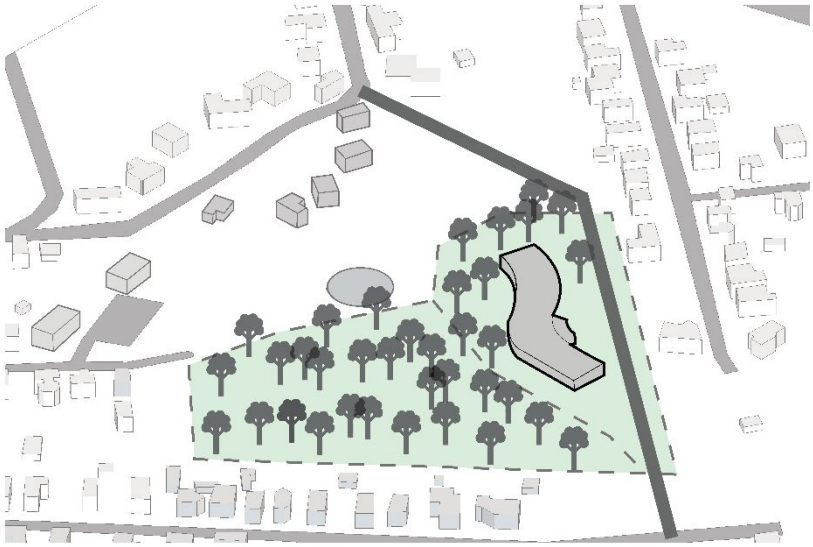
Street Frontage



Residential Frontage

Site Areal

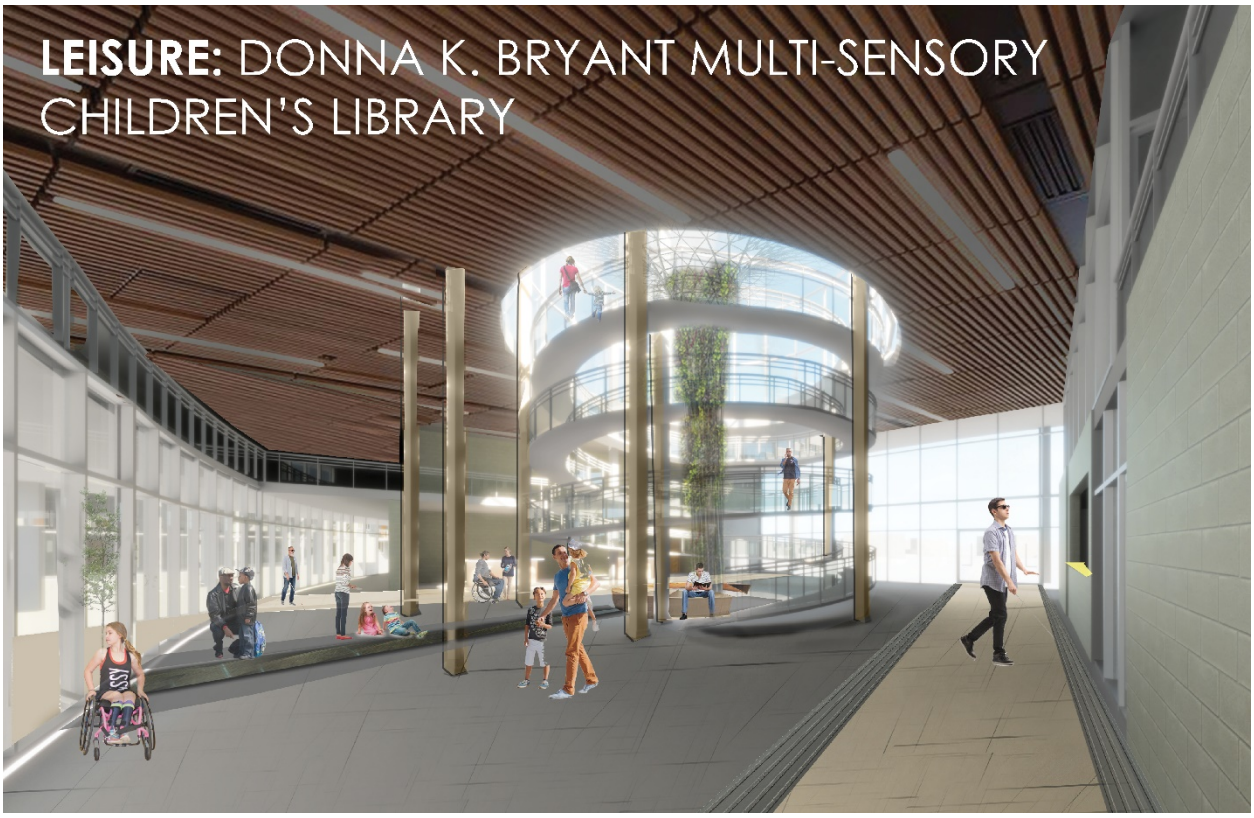
Site Plan



Phase 1

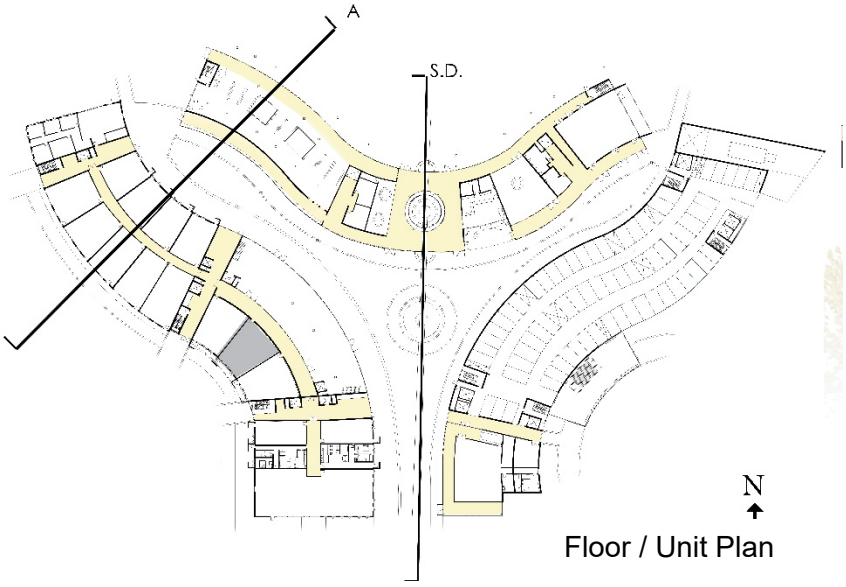
Phase 2

Phase 3



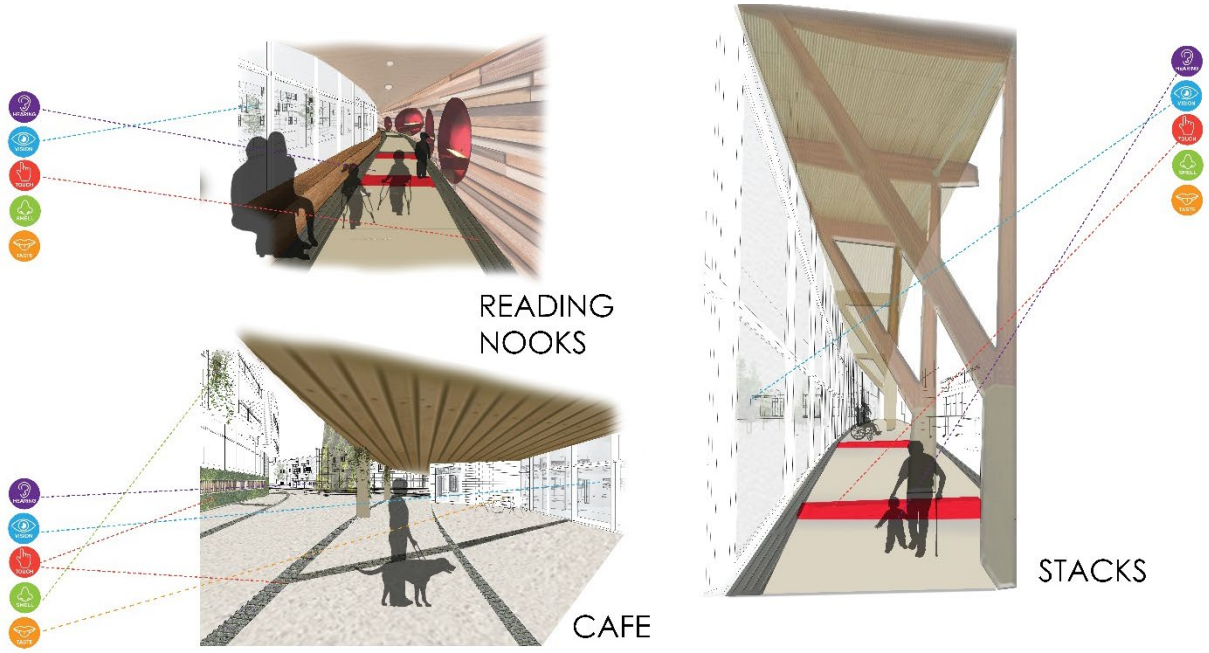
Leisure

3 BR 1 BA



Floor / Unit Plan

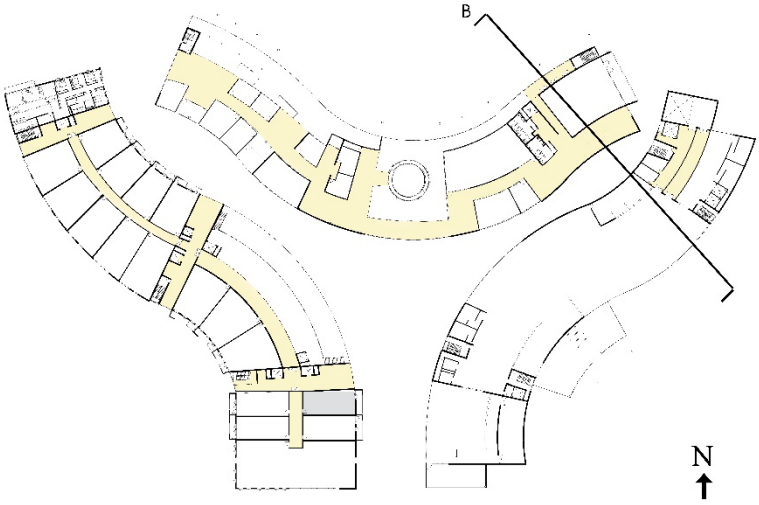
Leisure Elevation/ section



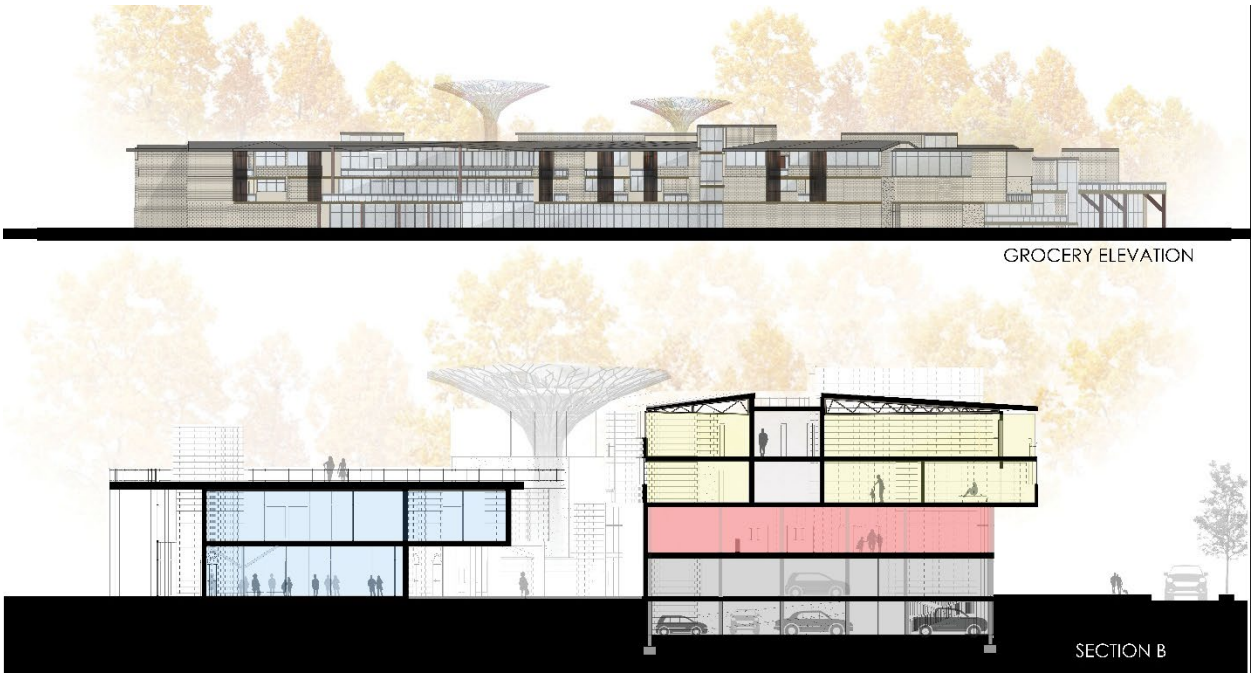
Leisure Design Principles

Work

1 BR 1 BA



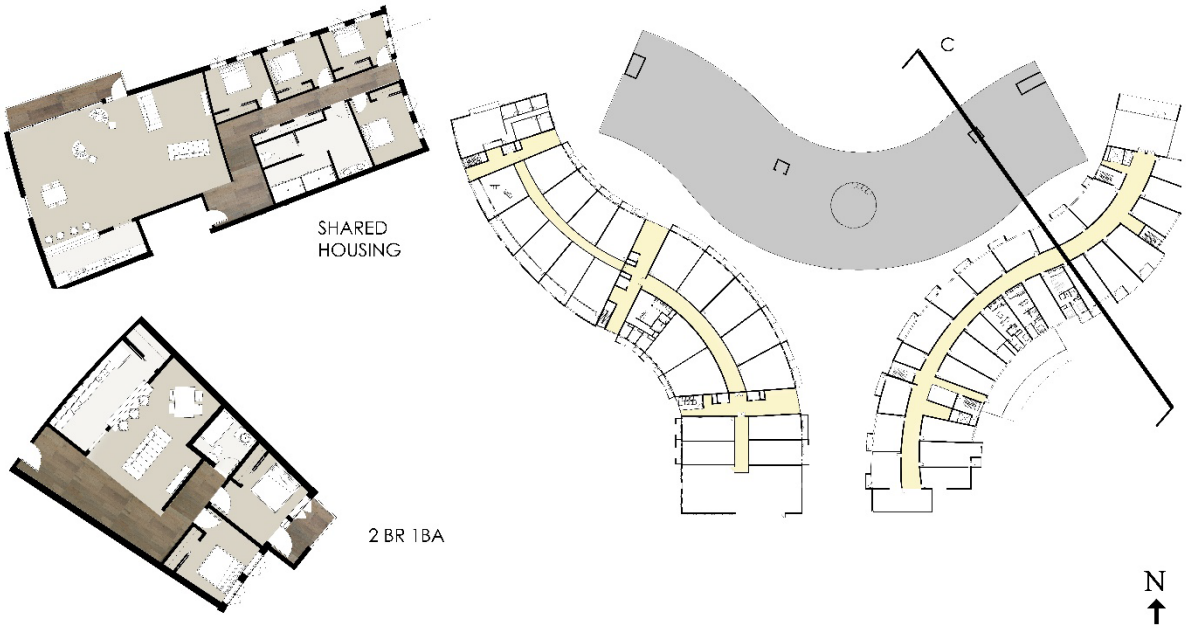
Work Floor / Unit plan



Work Elevation/ Section

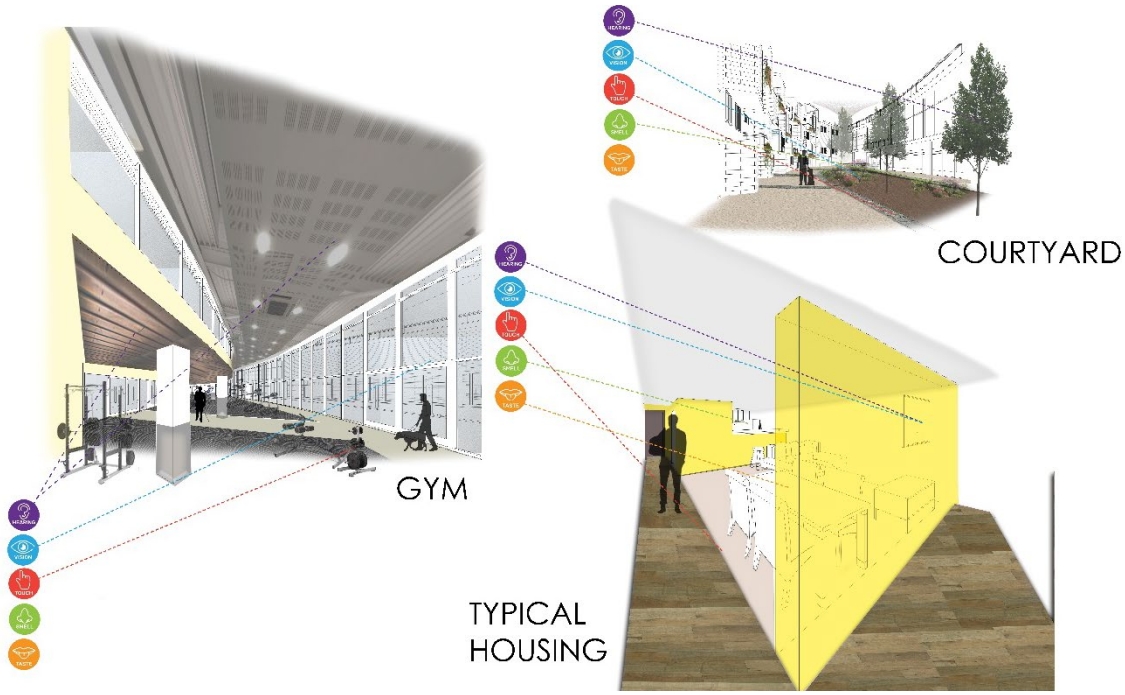
Work Design Principles

Work Live

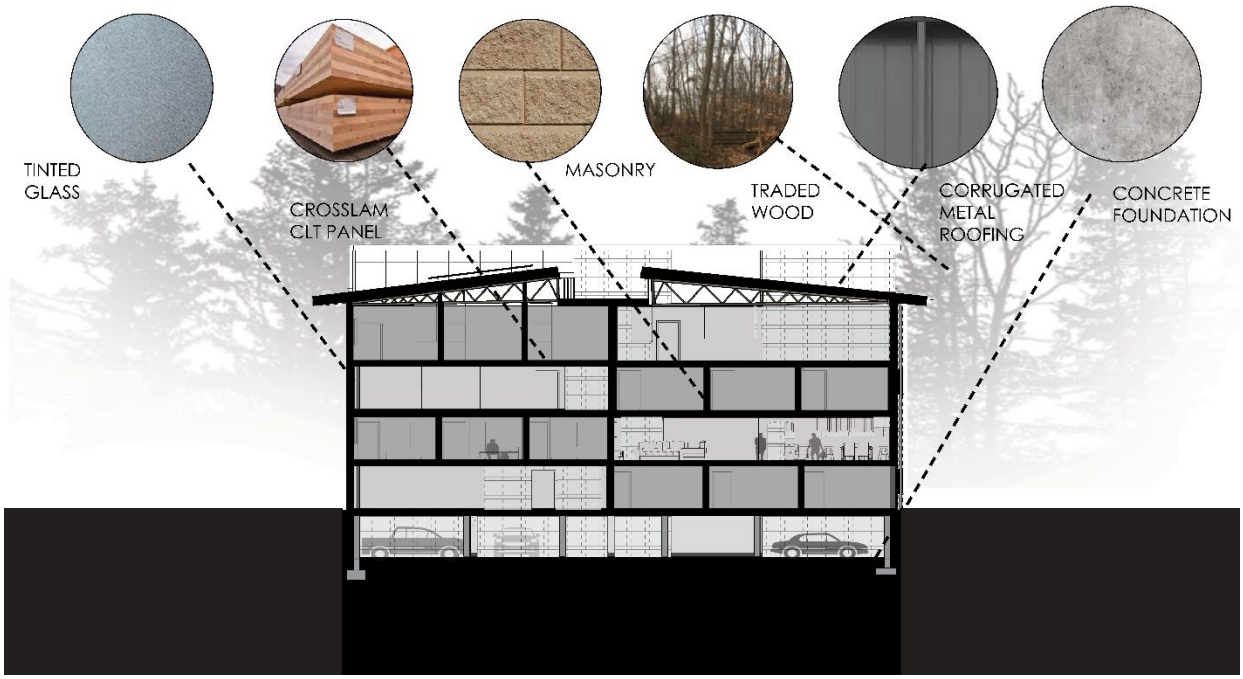


Live Floor/ Unit Plan

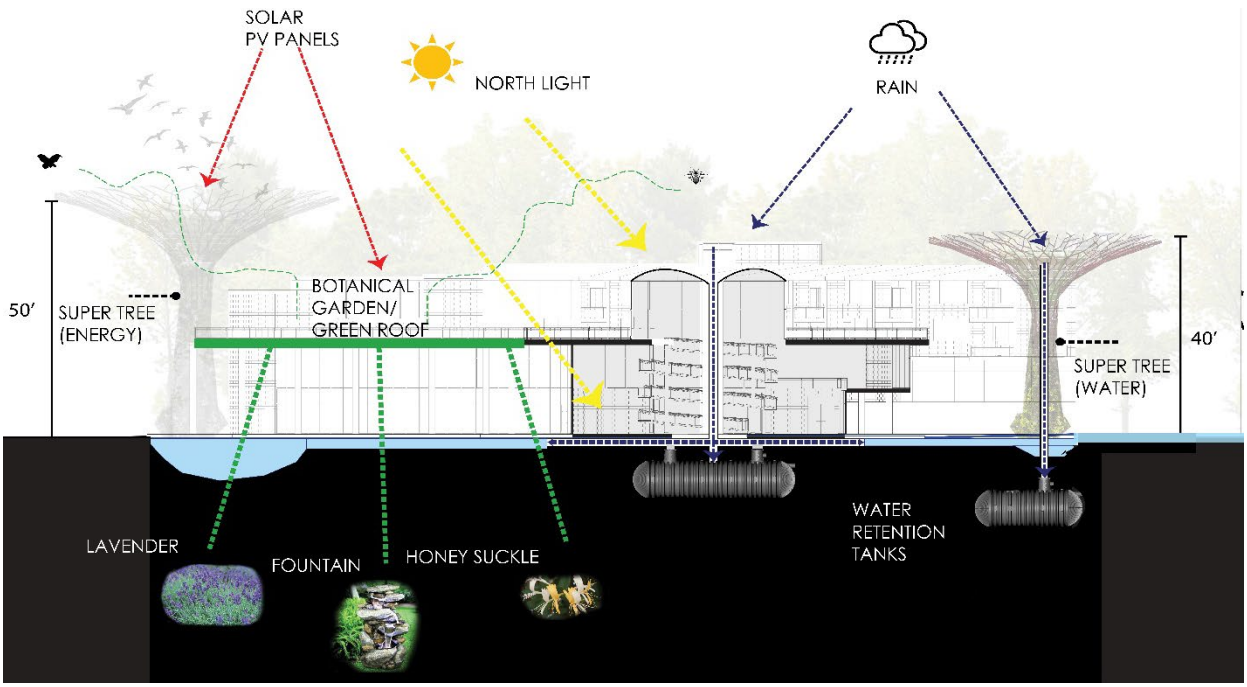
Live Section/ Elevation



Live Design Principles



Construction



Sustainability/Multi-Sensory

Crits Comments/ Goals Moving Forward

The Critics were mostly concerned with proper orientation, non-natural orientation tactics, implementation of technologies, as well as how the residential units can be improved. These were all aspects of the design that would drastically improve the overall design and navigation on this site.

Orientation:

The site overall has good natural orientation tactics. There is a central fountain and bio swale with moving water that will allow sound to orient the pedestrian to the center of the development. The next landmark is the nature trail access to the left of the site. A specific vegetation type that has a strong smell like a Pyrus Calleryana tree will direct the pedestrian to the nature trail. There will also be bird houses in this direction, and by using both smell and sound the user will be oriented to this trail. As for the landmark near the service road, the smell of coffee and the sound of cars will incline the pedestrian to orient in this direction. This direction also leads to a proposed dog park which can also help with orientation.

Façade treatment can become a way to orient a visually impaired user. Using different materials combinations and organizations can help to distinguish each building. In the current design, Building A has a green wall on the ground level that covers the parking garage which can help to distinguish this building from the others. Similarly building B has planters and tall wood screens on the interior and exterior façade than can begin to orient similarly. Building C has a covered entrance that is lined with a row of columns. This building is clearly distinguishable from the others and accessible from the interior courtyard only.

Technology:

An important addition to the natural orientation devices found on site, technology can begin to play a huge roll in increasing navigation and access to information on site. Technology has advanced drastically and there are plenty of voice and touch activated devices that can be added to the site, potentially making this development the “smartest workplace in the area”. These technologies are not only helpful for the visually impaired but can enhance the experience of the sighted as well.

In the project, technologies implemented in Amazon’s bookstore and grocery stores allow for the user to compile book lists to be delivered and grocery carts that both point out where items are located and how much they will cost in the end for fast and easy check out. These GPS technologies can be used in all aspects of the development.

Residential units:

The crits had an opposing view on how the units should be laid out. They pointed out that the bedroom units could be sacrificed and placed inward to allow the living / dining experience to receive light. They pointed out that it is important for the blind to understand the time of day it is, as the blind are often disoriented with the 24-hour day. I did not agree initially with this analysis. I found that placing the bedrooms on the exterior would enforce the blind to establish routine and become independent and active members of the community. Allowing the morning sun to indicate start of day and allowing the artificial light such as lamps be sufficient to illuminate those living spaces in the evening, to the night sky indicating time for rest is a seemingly better arrangement of space for the ideas behind the development.

Overall, the feedback was enlightening, and brough to the table ideas and solutions not quite reached in the initial investigation and exploration. I hope to use all advice in future developments across my career.

Appendix

Figure 1.1 Interview question for the Blind

Interview Questions For: Blind & Visually Impaired

Name:

Age (optional):

Age vision was lost:

Cause of Vision Loss:

Describe your vision capabilities if applicable:

1. Describe barriers / obstacles in a typical day.

2. Do you find it difficult to navigate in the public spaces you currently live near.

3. What is it like to use public transportation if applicable?

4. What public spaces do you find **most** accommodating and navigable?

5. What public spaces do you find **least** accommodating and navigable?

6. Do you think that the sighted make too many assumptions on your capabilities in public spaces?

7. What do you think the biggest misconception people have about blindness?

8. If you could give advice on how to educate the public about blindness what would it be?

Figure 1.1: Example Response Blind and Visually Impaired

Interview Questions for Blind or Visually Impaired

Name: Lisa S.

Age: 40's

Age vision was lost: Gradually lost sight over time in adulthood.

Cause of vision loss: Usher's Syndrome. I am also profoundly deaf. I have a cochlear implant in one ear and wear a hearing aid in the other. I will be getting a cochlear implant in my other ear in the near future.

Describe your vision capabilities if applicable.

1. Describe barriers/obstacles in a typical day.

- My vision is almost completely gone now. I have a tiny field of vision in one eye and no vision in the other. I have three children, one who is in her 20's, a second who is 12 and a third who will turn 3 years old. I have to rely a great deal on my two older children to help with the baby and to help around the house. I have a great deal if difficulty seeing where my youngest daughter is and can't always hear her to know where she is. It's difficult to cook and clean now that my vision is almost gone. It has been very difficult during the pandemic! I stay in my bedroom most of the time. I am still working but trying to see and hear on Zoom is extremely difficult. I rely on sign language and it's difficult to see the interpreter or other people who are signing when everyone is in a little box. I can pin the interpreter to make his/her screen bigger, but if the person running the meeting shares the screen it puts the interpreter back in a little box and it's very difficult to see. I am able to hear some with my cochlear implant but I miss a lot of information.

(hearing and visually) My coworkers often text me, especially if they see that I have misunderstood something that was said. I am still able to see text messages. It's exhausting always straining to see and hear, though. I have a couple if new devices that can enlarge the printed page and they are helpful. Another thing I am dealing with that is difficult for me is my family's understanding of my disability. I have always had the hearing loss, but was able to communicate through sign and spoken language. They are having difficulty dealing with the fact that I will be completely blind. They ask when will my vision get better or if there are other glasses I can get to help me see better. As my vision has decreased, I have had to rely on family and friends more and more and that has caused some issues. It is depressing, and I am also trying to accept and deal with the loss of my vision. I have my own fears of being totally blind and missing all the things I used to see.

2. Do you find it difficult to navigate the public spaces you currently live near?

- I don't go out much at all anymore, mostly just to doctor's appointments. I rely on my husband and oldest daughter to do the grocery shopping or get other things we need. If I am out in public I use my long cane and the guide of my family members.

3. What is the use of public transportation if applicable?

- I do not use any public transportation at this time. Before the pandemic my husband and coworkers gave me rides to and from work. I looked into Metro Access at one point, but felt

more comfortable with people I know and who know how to communicate with me. It would also be more expensive to use on a daily basis.

4. What public spaces do you find most accommodating and navigable?

- Now that I have lost so much vision I do not get out as much as I did in the past. Because my vision and hearing are so limited, I don't feel as comfortable as I once did.

Figure 1.2 : Interview Questions for the Sighted

Interview Questions For: The Sighted

Name:

Age (optional):

1. Describe what it would be like if you were completely blind with your current lifestyle. How would it change?

2. How do you navigate in the dark?

3. Have you ever interacted with a blind person?

4. Have you ever helped a Blind person maneuver in a public space?

5. What do you think is the biggest misconception sighted people have about the blind?

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